January 17, 2018

Exhibit 12

Wolves of the Rockies

Comments Prepared for Mt EQC *17 January 2018*

Chronic Wasting Disease

Today's discussion on (CWD) Chronic Wasting Disease is an important topic. For it now calls a part of Montana home. We are encouraged that Montana Fish Wildlife & Parks is attempting to be proactive and not reactive.

Other Midwest states have spent millions of dollars in an attempt to stop or at least lessen the impact of CWD. This attempt to reduce CWD fell far short of its objective. Currently, Montana Fish Wildlife & Parks is struggling to stop the spread of the zebra mussel. Allocating $10 million dollars of sportsmen and women's dollars to prevent and halt the spread of this bivalve mollusks.

Now Montana is facing the spread of CWD. Some researchers believe that because of the eradication of wolves and other Apex predators many years ago allowed or at least contributed to giving CWD a foothold and spread. As everyone is aware of the spreading of CWD will threaten tourism, hunting, outfitting and other outdoor related activities.

It would be extremely wise and financially beneficial to all interested parties to allow wolves and other Apex carnivores to assist in containing and controlling CWD. Currently, Montana is over elk objectives in many areas. Wolves are virtually being hunted with no quotas. With the exception of WMU 313, 316 & 110. We should consider dialing back the very liberal wolf harvest season.

At the December 7th, 2017 Montana Fish, and Wildlife Commissioner season setting for wolves and other wildlife hearing Wolves of the Rockies testified that wolves and other carnivores would help contain and possibly prevent the spread of CWD. This theory is widely supported by wildlife biologist and researchers throughout the United States. However, MtFWP Game Management Bureau Chief John Vore later told the Commissioners that wolves and other predators would have a minimal impact on CWD and that would be only at the late stages of CWD in ungulates. Wolves of the Rockies later researched Mr. Vore's claim of late-stage predation of afflicted ungulates and could not find research that supported Mr. Vore claim. We then emailed Mr. Vore and

requested the research that supported his claim. He indicated that there was no research that was currently available to support his comment. This clearly indicates to us and others that the senior leadership at MtFWP is hellbent on continuing the "by design" reduction of Montana and Yellowstone wolf population no matter the cost to the wildlife and environment.

After speaking to wolf researchers, wildlife biologist and other researchers it is very clear that wolves and other carnivores have a strategic role to play in helping us manage CWD.

Wolves are opportunistic hunters. They have the unique ability to sense and exploit an ungulate weakness. The olfactory centers in a wolf's brain are much larger then humans. It is about the size of a regular lime. While mans is smaller then a dime. Wolves would prefer to kill an unhealthy ungulate then risk injury from a healthy ungulate. Wolves search for vulnerable prey twenty-four hours a day, 365 days a year. And perhaps as important wolves would not cost one cent in MtFWP funds.

It would behoove Montana Fish Wildlife & Parks and this committee to consider and encourage at least the discussion of letting wolves be part of the solution to CWD than frittering away sportsmen's and women's dollars using methods demonstrated in Wisconsin and elsewhere to be ineffective.

Respectfully Submitted,

President
Wolves of the Rockies

Stevensville, MT

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Chronic Wasting Disease
OCTOBER 8, 2017

Greater Yellowstone's Coming Plague
WITH THE ARRIVAL OF CHRONIC WASTING DISEASE IMMINENT, IS GOVERNMENT MISMANAGEMENT THREATENING THE HEALTH OF GYE'S ELK HERDS AND HUMANS?
by Todd Wilkinson

Is this where a pandemic of Chronic Wasting Disease in Greater Yellowstone could begin? Thousands of elk bunched together on the National Elk Refuge in Jackson Hole, Wyoming. Photograph "Winter Herd" by Thomas D. Mangelsen
PART ONE

On a map, "Deer Hunt Area 17" is unlikely to ring any bells of geographic recognition, even for residents in hunting-crazed Wyoming.

Located northwest of Gillette in the Powder River Basin—a sweep of rolling, mostly treeless high plains embedded in the largest coal-producing region in America—Hunt Area 17 on Monday, December 19, 2016 became one of the latest in Wyoming to have a publicly-confirmed case of Chronic Wasting Disease.

"If you see a deer, elk or moose that appears to be sick or not acting in a normal manner, please contact your local game warden, wildlife biologist or Game and Fish office immediately," Scott Edberg, deputy chief of the Wyoming Game and Fish Department's wildlife division, said in a press release.

Game and Fish added this to its statement, deferring to the assessment of medical professionals at two major public health entities: "The Centers for Disease Control and the World Health Organization recommend that people should not eat deer, elk or moose that test positive for CWD."

Many more confirmations of CWD are expected to come soon in Wyoming. In fact, another arrived on September 25, 2017, with a mule deer buck testing positive in Dear Hunt Area 19. It's not often that citizens receive advisories from a government agency cautioning them the wild edibles they have traditionally harvested from nature for generations should first be tested to determine if they are safe to eat.

But that's exactly what Wyoming's wildlife agency did. Not long ago, Game and Fish posted an additional bulletin, alluding to the findings of a non-peer-reviewed Canadian study in which macaques (primates with a genetic makeup very similar to humans) were fed deer meat contaminated with CWD and fell fatally ill with disease.

CWD is on the minds of countless hunters in North America. Randy Newberg knows. He's an avid Bozeman, Montana-based sportsman and conservationist who is host of the Sportsman Channel's Fresh Tracks With Randy Newberg and one the most popular web podcasts devoted to public lands hunting.

Whenever Newberg posts a new podcast, it often is downloaded by between 100,000 and 150,000 people. He has a YouTube channel with nearly 40,000 subscribers and videos that have generated 200,000 views. Additionally, his website has 43,000 registered members and his Facebook page 50,000 followers. Hunters listen to and generally trust what he has to say.

"Am I worried about CWD?" he asked as the fall 2017 hunting season was getting underway. "Yes, I've been worried about it for years in terms of what it means for the health of wild deer, elk and other animals." He acknowledges widespread confusion among hunters and that "public discussions about CWD are all over the map".

"There are deniers and there are over-reacters," he said. "Where I am with CWD comes down to the expert opinions of scientists, many of whom believe we could be setting ourselves up for disaster."

Ever increasingly, in the rapidly-expanding reaches of the U.S. landscape becoming classified as CWD-endemic areas, huge numbers of outdoorspeople have trepidation about the wholesomeness of big game meat they bring home to the family dinner table.

The laboratory study with macaques in Canada mentioned above—if the results are confirmed by second and third parties and replicated in months and years ahead—would represent a frightening watershed moment in thinking about CWD's ability to cross species barriers. It's a malady whose seriousness as a possible risk to humans has often eclipsed discussion of its already real impacts to nature.
If scientists were tasked with designing an experiment to create ideal conditions for a pandemic to take hold, involving a transmissible infectious disease in wildlife during winter when they are most stressed by the elements, one example would be the complex of artificial feeding operations identical to those operating today in western Wyoming. —Dr. Thomas Roffe, former chief of wildlife health for the U.S. Fish and Wildlife Service

Indeed, the potential menace CWD represents to the persistence of Greater Yellowstone's migratory wildlife has been downplayed and minimized for years in Wyoming.

Numerous critics interviewed for this series say Wyoming's hands'-off approach to dealing with CWD is one of the most glaring examples in modern wildlife history where a preponderance of growing scientific evidence, supporting the need for aggressive intervention to slow a potential catastrophe, has been willfully dismissed to fit entrenched political agendas and commercial interests.

Like the expanding impacts of human population growth and climate change in the Greater Yellowstone Ecosystem, CWD represents a true test, they say, of whether public and private land managers, elected officials and citizens in the region can really come together to address landscape-level challenges.

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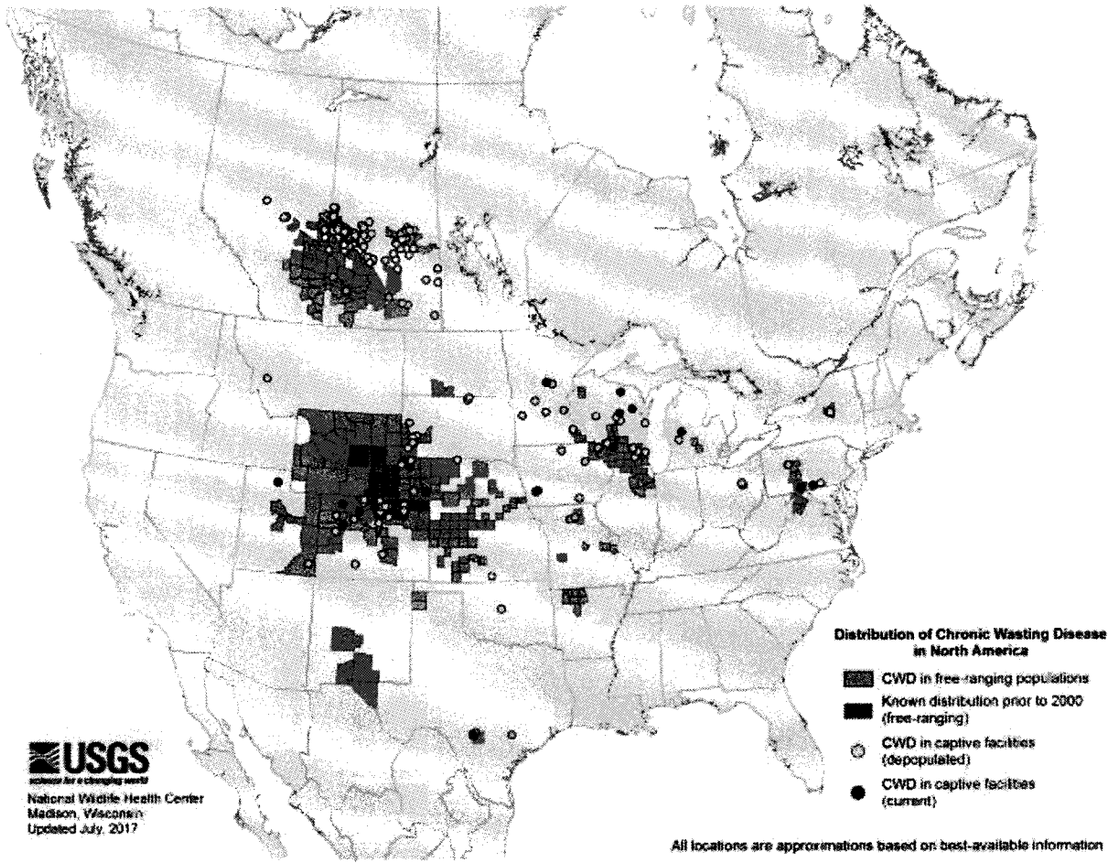
CWD afflicts members of the cervid (deer) family, which, in the Rocky Mountain West, includes mule and white-tail deer, elk, and moose. (Caribou, which dwell in the arboreal and tundra north, are also deer family members).

Testing to determine if game meat is infected with CWD is made only after an animal is dead, yet living carriers of the contagion can appear normal and asymptomatic even when stricken with the disease that will kill them.

Endemic zone classifications for CWD applies to areas where the disease is now believed to be present in animals. But as with the testing mentioned above, lack of confirmation of a CWD-infected ungulate being present in a given area does not equate to absence of disease.

While Wyoming Deer Hunt Areas 17 and 19 are a few hours' drive from Greater Yellowstone, CWD endemic zones already extend figuratively to the doorstep of Yellowstone and Grand Teton national parks, the adjacent National Elk Refuge in Jackson Hole and over half of the ecosystem's national forests—though many hunters and the general public may not be aware. The Powder River Basin, notably, also spills northward across Wyoming's border into Montana.



The Greater Yellowstone Ecosystem, along with Montana and Idaho, are said to be free of Chronic Wasting Disease but for how long? Some scientists say the deadly disease is already here. Map showing the progression of CWD in the U.S. and Canada courtesy U.S. Geological Survey's National Wildlife Health Center
Today, CWD endemic zones cover nearly all of Wyoming and, nationally, portions of 21 other states plus a couple of Canadian provinces. No cases have yet turned up in Montana and Idaho but CWD is a disease that, like its peripatetic victims, does not recognize invisible state boundary lines.

Incurable, progressive, often slow to incubate, and except in the rarest of circumstances always-fatal, CWD has been described by epizoologists as “a slow-motion wildlife disaster” in the making; it involves an exotic plague—a cousin to dreaded “Mad Cow Disease"— that, true to its name, “chronically” festers at first in wildlife at low-grade levels, spreading between animals in dribbles and drabs.

CWD causes individual victims to become emaciated with telltale symptoms: “vacant stares, drooping ears, stumbling movements and drooling”. Internal physiological effects can include transforming brains into the consistency of mushy Swiss cheese. Animals withering in the last phase of CWD behave and look remarkably similar to humans incapacitated in the final stages of severe dementia. Their haggard, bony appearance could also be mistaken for animals emaciated from hard winters.

Scientists say CWD can take years to assert full impact at a population level. It has been spreading steadily in individual animals westward across Wyoming after it was diagnosed in the southeastern corner of the state decades ago.

Besides being poised to reach Montana and Idaho from infected migratory animals in Wyoming, CWD also is pressing southward toward Montana via infected wildlife from Alberta and Saskatchewan and westward from the Dakotas. At present, there currently are neither vaccines available to stop it nor curative medicines that can be dispensed to hosts having it. Whether a person hunts and consumes big game or is among the countless millions of Americans who simply enjoy having healthy wildlife on the landscape, CWD is creating impacts that scientists say they are just beginning to comprehend.
The only hope for potentially dampening its impact, according to leading wildlife authorities, is taking actions that just happen to cut against the fundamental grain of how Wyoming has approached wildlife management for generations. In a nutshell it means halting century-old public feeding of wildlife and viewing predators, namely wolves, as allies in fighting diseases instead of as scourges that Wyoming would just as soon wipe off the landscape.

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The origin of CWD is inexact. Some believe it is related to a scrapie outbreak which afflicted domestic sheep and then jumped species. In 1967, CWD was affirmed among captive deer kept at a research facility near Fort Collins, Colorado and then spread into wild deer and elk herds in that state.

Wildlife experts say the prevalence of CWD in some southeast Wyoming mule deer herds already ranges between 20 and 45 percent. Most victims die within two years of becoming infected but can live for half a decade. CWD is more common in bucks than does and prevalence oscillates differently in deer than elk but some outbreaks of CWD in both captive deer and elk have been equally severe.

Whether a person hunts and consumes big game or is among the countless millions of Americans who simply enjoy having healthy wildlife on the landscape, CWD is creating impacts that scientists say they are just beginning to comprehend.

Twenty years ago, Jim Posewitz, a revered sportsman in Montana and lifelong conservationist who worked for the Montana Department of Fish Wildlife and Parks, expressed concerns about CWD to me around the time that voters in his state went to the polls passing a ballot initiative to outlaw wildlife game farms.

Game farms are private facilities where wildlife is husbanded like livestock, sometimes to serve as trophies in canned hunting behind fences, sometimes to be used as breeding stock, or sold as meat to restaurants. Some horns from male deer and elk at game farms have been exported to Asian markets where they are marketed as traditional medicines and aphrodisiacs.

The campaign to ban game farms in Montana was prompted by rising concerns relating to diseases. One game farm deemed especially problematic was a fenced compound operated by Welch "Sonny" Brogan just outside of Gardiner, Montana near the northern border of Yellowstone National Park and right in the middle of a wild elk and bison migration corridor.

The late Mr. Brogan, who became known as "the granddaddy" of Montana game farms, was charged in 1989 with capturing wild elk and having poorly maintained fences that could result in captive elk escaping. Brogan fought the charges but his conviction was upheld by the Montana Supreme Court in 1993.

The reason the fencing issue was so important is that Brogan at one point was accused of selling some of his captive elk to a game farm in Canada—animals that later became sickened with bovine tuberculosis, a virulent disease that not only kills wildlife but is a hazard to humans. An investigation resulted in Brogan's facility being placed under quarantine and him ordered to pay $100,000 to the game farm with whom he did business.

"The Offering", a painting by George Carlson
Around the same time as Montana's ballot initiative, a Canadian biologist named Dr. Valerius Geist, who is today a professor emeritus in Environmental Science at the University of Calgary, was on the stump warning about the consequences of epizoonotic diseases flaring among captive animals in game farms throughout the Canadian prairie provinces. He and I had many long conversations and he warned that CWD was more frightening than any other malady he was tracking.

A major scare arrived in 1999 with the discovery of nine captive CWD-infected elk at an "alternative livestock" facility near Philipsburg, Montana. For a time, some wondered if any had escaped to the wild. Geist's jeremiads helped sway public opinion in Montana to realize the seriousness risk of disease.

Echoing Geist, Posewitz said two decades ago that "once, and if, CWD ever arrives in our wild deer and elk herds in Montana, all bets are off. You won't be able to control it; it's going to forever change how we think about those animals."

Many believe the tipping point moment with CWD, predicted ominously by Posewitz and Geist, has arrived. Are natural resource agencies in Greater Yellowstone adequately prepared to deal with its onset?

With CWD now bearing down on Montana from two different directions, the state has beefed up its surveillance regimen. Since 1998, postmortem samples from more than 17,000 wild elk, deer and moose have been tested for CWD in Montana but no positives have yet turned up. Montana also encourages motorists who salvage road-killed game animals for their dinner table—yes, there's a state law allowing people to do that— to turn in the heads of deer and elk recycled from highways for testing.

Most troubling to biologists is how CWD could affect wildlife in Greater Yellowstone already coping with the stresses of habitat loss caused by a rapidly-expanding footprint of human development, and by climate change transforming the ability of landscapes to support large numbers of wild ungulates.

To readers who don't know, Greater Yellowstone, which overlaps the corners of northwestern Wyoming, southwest Montana and eastern Idaho, is a 22.5 million-acre region that, due to its migratory wildlife, is often compared to the wildlife-rich Serengeti region of eastern Africa. It is the most iconic and still ecologically intact wildland ecosystem in the Lower 48 and one of the best-known in the world.

But because of the way elk are controversially managed in western Wyoming, it represents a case study, scientists say, for how not to steward public wildlife in the face of an advancing pandemic.

Dr. Thomas Roffe, a veterinarian and former national chief of wildlife health for the U.S. Fish and Wildlife Service, told me this: if scientists were tasked with designing an experiment to create ideal conditions for a pandemic to take hold, involving a transmissible infectious disease

in wildlife during winter when they are most stressed by the elements, one example would be having game farms. The other would be creating a complex of artificial feeding operations identical to those operating today in western Wyoming.

Indeed, CWD has never arrived in a healthy, still-functioning wild ecosystem with so much going on in terms of interactions between predators and prey, sheer numbers of potential victims, and complicated migrations happening over long distances on a high-profile public stage with a global profile.

The stakes are high. Hundreds of thousands of wild elk, mule and white-tailed deer move in herds or small bands, circulating throughout Greater Yellowstone across jurisdictional boundaries of land management agencies, intermingling seasonally and dispersing again across huge, mind-boggling expanses of terrain. Those animals, in turn, come in contact with other herds up and down the northern Rockies.

The wild, healthy ungulate herds function like pumps of biomass flowing across the landscape, providing nourishment for a wide range of predators and scavengers, including grizzlies, wolves, wolverines and even rodents.

Dr. Thomas Pringle, a molecular bio-geneticist and respected authority on CWD and prion diseases, said mammal-to-bird transmission is highly improbable. He also said that birds such as raptors, corvids and other avians are not carriers. Dr. Pringle has been vocal in his concerns about the reach and impact of prion diseases, and Mountain Journal will highlight his worries about transmission in subsequent parts of this special series.

The Wyoming feedgrounds, he and others say, represent a point of tightly-packed unnatural confluence for several herds in winter, meaning that if animals get sick there, they will carry diseases with them elsewhere. Similarly, if stricken animals arrive on the feedgrounds, there is a much stronger probability, given the notoriously high densities of animals, that they could be seeds to an outbreak. This is one of the golden rules of epidemiology.

In addition to Greater Yellowstone's global reputation for hunting, non-lethal wildlife watching in Yellowstone and Grand Teton national parks alone is the anchor to a nature tourism industry estimated to be worth at least $1 billion annually to local economies. Wildlife watching supports a lot of businesses in every gateway community.

CWD is beginning to enter the Greater Yellowstone from the east and south. This is one of the ominous, urgent questions that speaks to why CWD is more than just a possible worry for hunters putting game meat in their freezers:

What happens if, and when, elk, deer, and moose in Greater Yellowstone start dropping dead from CWD, whether in the valleys and geyser basins of Yellowstone Park in front of tourists, the middle of the Elk Refuge along busy U.S. Highway 191 in Jackson Hole, the flats of Grand Teton or even within the city limits of Bozeman, Cody, Lander and Rexburg?

Will dead animals be quickly retrieved to prevent them from causing accumulating environmental contamination? Will the carcasses be dumped in landfills or incinerated? Does it mean that every live deer, elk or moose that looks lean and weakened after surviving the winter will be treated as a possible CWD carrier?

How does having CWD-infected herds affect the public perception of wildlife?

It's a grave prospect on the minds of Yellowstone Superintendent Dan Wenk and his staff. Wenk, however, admits there is no plan, no coordinated strategy existing between state and federal agencies for how to confront CWD.

The very government entity that was created to formulate regional strategies—the Greater Yellowstone Coordinating Committee—does not have a unified plan.

Apart from CWD's deadly consequences for members of the deer family, concerns abound about CWD's potential for crossing other species barriers. There is fear about it potentially infecting mammalian predators, ranging from grizzlies, wolves, coyotes and foxes to other scavengers that feast upon dead animals. Yet the real wild card is what risk, if any, CWD and its possible mutations poses to human health?

That risk appears to be remote, but it might or might not be.

Some scientists, like Dr. Don Davis, professor emeritus at Texas A & M University and a vocal defender of game farms in Texas where CWD is a growing issue, claim the risk is nominal, that raising the threat of CWD to human health is nothing more than media hyperbole. He wrote a couple of diatribes after media reports about the Canadian macaque study.

In a recent op-ed, Davis highlighted the important fact that there hasn't been a single verified case of humans contracting CWD by eating an infected big game animal. "As a research scientist with 40 years of experience in the area of wildlife diseases, I have been regularly disappointed, disgusted, alarmed, and amazed at both the amount and frequency of alleged facts reported on CWD. These 'facts' are based entirely on totally unsubstantiated rumor or—even worse—on horribly misquoted science by misguided or misinformed individuals," Davis wrote recently in an editorial widely circulated to newspapers by an organization called The Exotic Wildlife Foundation.

Dr. Davis' assessment, however, is far from universally shared by peers working in wildlife medicine, including bio-geneticist Pringle. In fact, people I spoke with say Davis' opinion would be in the minority.

A far greater danger is minimizing the seriousness of the possible threat, suggests Dr. Michael W. Miller, a senior wildlife veterinarian with the Colorado Division of Wildlife and a noted CWD authority. With prion diseases, increased likelihood of human infection is really a matter of a lot of people eating a lot of contaminated game meat.

"For a long time, some have been clinging to the naive hope that if we just ignore chronic wasting disease and do nothing, it will go away," Dr. Miller told me. "The problem is that CWD has not gone away. It is not becoming rarer in the wild. In fact, it's become measurably worse over time. It is becoming more prevalent in wildlife, not less."

Miller, known for his cool-headed discussions about risk, acknowledges that he is concerned foremost about its impacts on wild ungulates and the domino effect of direct and indirect impacts it could set off for other species.

The spread of CWD in free-roaming North American wildlife is considered a new disease phenomenon, epizoologists say; in other words, it hasn't been in the environment very long and given its brevity on this continent, there are many unknowns of how it will become ultimately manifested.

Unfortunately, the more that new information has emerged in recent years, the level of concern has risen, not fallen. Some contagious diseases over the course of time run their course, leave behind survivors that carry immunity and then die down. Scrapie in domestic sheep is an example of that, Dr. Miller says. But CWD is accelerating in its geographic reach.

The agent that causes CWD is not a virus, bacteria, fungi or parasite—not a typical living organism— but misshapen proteins called prions without DNA and RNA structure that become harbored mostly in the brains and central nervous system of deer family victims.

As one researcher told me, "they [prions] are weird, they're not like normal proteins and unlike viruses and bacteria they do not produce an immune response from the organisms they attack. We don't know what activates them and we don't know what the triggers are that could cause them to mutate, making them more conducive to move from one species to another." In this case, "mutation" means prions being altered in ways that increase the odds of transmission between wildlife, livestock, and people.

CWD is categorized among a general suite of neurological illnesses known as transmissible spongiform encephalopathies (TSEs). In cattle (and other hooved animals). the disease is grouped among a malady category called bovine spongiform encephalopathies or BSEs.

CWD, also nicknamed "mad deer" and "mad elk" diseases, is a cousin of scrapie (which targets domestic sheep). To claim, as some do, that CWD won't proliferate within Greater Yellowstone deer and elk, and possibly represent a hazard to livestock or predators, which includes humans, is, in the opinion of experts I spoke with, to deny the reality of what has already been demonstrated elsewhere with prion diseases.

The best example of species barriers being breached with TSE prion diseases is found in Britain where around 200 humans who ate domestic cattle infected with Mad Cow died. The human version of Mad Cow Disease is a TSE called Creutzfeldt-Jacob Disease and another, variant-strain Creutzfeldt-Jakob-Jacob, both of which are very rare.

British cattle were believed infected after the remains of sheep suffering from scrapie were ground up and blended with feed poured into their troughs. The Mad Cow scare, which made headlines and caused panic around the world, resulted in the depopulation and incineration of millions of domestic cows that were potentially exposed to sickened animals. It also elevated concerns about lasting environmental contamination in the ground, a worry later validated by an experiment in Wyoming.

Likely, millions of people in Britain and elsewhere came in contact with BSE-infected beef, hence the parallel to keep in mind with what Miller said about the likelihood of CWD transmission to people increasing with lots of hunters eating lots of contaminated game animals.

Were CWD to afflict humans, the most likely route of transmission would be from CWD-carrying wildlife infecting cattle or domestic sheep and then humans consuming those animals. There are no documented cases of prions shed by deer or elk infecting cattle.

An advisory posted by the Centers for Disease Control in Atlanta, the nation's premiere authority on infectious pathogens, states: "Concerns have been raised about the possible transmission of the CWD agent to domestic animals, such as cattle and sheep, which may come in contact with infected deer and elk or CWD-contaminated environments. If such transmissions were to occur, they would potentially increase the extent and frequency of human exposure to the CWD agent. In addition, passage of the agent through a secondary

host could alter its infectious properties, increasing its potential for becoming more pathogenic to humans."

Prions are notoriously hard biological particles to destroy. Cooking does not kill or immobilize them. They can remain actively infectious in the tissues and fluids of living and dead animals. They can also leach into the environment through feces and urine and, as the carcass of a dead animal decays, contaminate soils and water for long, indefinite periods of time.

Recent scientific studies in controlled settings also have shown that prions shed into the ground, especially in clay soils to which they bind, can even be taken up in living vegetation. And many believe that CWD prions could be dispersed more widely across landscapes by being bound up in alfalfa that is shipped far and wide as hay bales and then fed to livestock.

So, is it possible for CWD prions to mutate and thereby become transmittable from members of the deer family to people, or other creatures eating contaminated meat, or by merely ingesting infected brain, spinal fluids, plants and water?

What about elk and deer that might appear healthy, but actually aren't and are then consumed by people, or asymptomatic infected animals that come into contact with other animals being packaged at local meat processors?

What are the odds that domestic livestock grazing on contaminated grass growing from contaminated soil, be it on public or private lands, could become infected?

The answers are that no one knows yet, but some of the emerging indicators keep the level of concern heightened. Uncertainty is why the CDC and World Health Organization have for years offered their cautions against human consumption of cervids that test positive for CWD.

Whether actual risk of prion transmission to humans is low, as Dr. Davis suggests, or higher, if mutations occur enabling CWD to jump species, it is a calculation that individuals must make in eating game meat.

Although it is admittedly a small sample size, a dozen different people— (scientists, wildlife managers, and conservationists)—well versed in the research of CWD and who also hunt elk and deer, told me they would not feed even healthy big game coming out of a CWD-endemic area to their families. That hasn't stopped deer hunters in Wisconsin (which we'll get to later in this series)

Recent studies, like the research on macaques in Canada, suggest CWD jumping the species barrier to humans is possible. But Dr. Davis questions the techniques used in the studies and he points out that a similar earlier experiment demonstrated no linkage, a reference that will be explored in ensuing parts of this series.

While the risk of CWD prions infecting people is low, threats to wildlife and landscape, however, are not. Some have alluded to CWD's arrival in Greater Yellowstone as a "ticking time bomb about to go off in the premiere wildland ecosystem in the Lower 48".

BSE-related prions have demonstrated their ability to transcend boundaries between sheep and cattle, and across deer family members, and even from cattle to bison and, as demonstrated by Mad Cow, to people.

Undeniable, experts say, are the threats posed to wild ungulates. Ironically, the future health of Greater Yellowstone's vaunted migratory ungulate herds is being jeopardized by the very

government agencies whose duty it is to protect public wildlife from harm, says Lloyd Dorsey, conservation director with the Wyoming state chapter of the Sierra Club.

Even a federal appellate court has rebuked the U.S. Fish and Wildlife Service for engaging in management malpractice and violating federal laws.

Ground zero for this prima facie argument is the National Elk Refuge home of the Jackson Elk Herd, the most famous wapiti herd in the world. The 24,700-acre Elk Refuge is administered by the Fish and Wildlife Service, long touted as the top wildlife agency on the globe.

Nearby, in western Wyoming are the 22 feedgrounds run by the Wyoming Game and Fish Department. Artificial feeding of wildlife in ways that bunch animals in large numbers is considered a cardinal sin in modern wildlife management because of the ripe conditions it fosters for disease outbreaks.

At the Elk Refuge alone during the winter of 2017, more than 8,800 elk converged around artificial food rations given to them. Combined with the state feedgrounds, upwards of 21,000 wild wapiti are congregated unnaturally together in western Wyoming, leaving them more vulnerable to catching not only CWD but bovine tuberculosis, Septicemic pasteurellosis and hoof rot. High rates of brucellosis infection among wild elk nourished at feedgrounds prove the point.

Wyoming for a long, long time has justified its refusal to close down feedgrounds by, more or less, portraying CWD as merely a hypothetical risk.

In August 2004, the Wyoming Game and Fish Department released what it called a comprehensive white paper titled "Elk Feedgrounds in Wyoming".

Its authors were: Ron Dean, Mark Gocke, Bernie Holz, Steve Kilpatrick, Dr. Terry Kreeger, Brandon Scurlock, Scott Smith, Dr. E. T. Thorne, and Scott Werbelow. "Many people are concerned that elk on feedgrounds may mimic the circumstances of elk in captivity and suggest that feedgrounds will result in high CWD prevalence resulting in drastic population declines as implicated by the disease models. Although this may happen, a perfectly acceptable alternative hypothesis is that CWD will have little or no impact on elk populations based on the known low prevalence rates for CWD in wild elk. Although there are many opinions, no one knows what will happen if elk on feedgrounds become infected with CWD."

Wyoming politicians and associates have demonstrated their disdain for scientists in federal agencies raising the certainty of CWD, and administrators in the Wyoming Game and Fish Department have sent a clear unwritten message down the ranks that dissent—i.e. staffers who say feedgrounds should be shuttered— will not be tolerated.

Jackson Hole valley folk, some of whom hail from the same families who in the 1930s and 1940s fought creation of Grand Teton National Park, have also taken out full-page ads in the local newspaper condemning fellow citizens and public servants who speak a different reality that does not comport with their own world view and economic self-interest.

Bruce Smith, who spent decades at the National Elk Refuge rising to the rank of senior biologist and who wrote an acclaimed book, "Where Elk Roam: Conservation and Politics of Our National Elk Herd", dared on several occasions to publicly declare the era of artificially feeding elk has to end. That was met by calls for his firing as a civil servant and later as an alleged speaker of heresy in local newspaper ads.

If Wyoming believes it will be able to market its way out of a CWD crisis or deny culpability for a problem it has known is coming, Smith told me recently, then it is in for a rude awakening. This isn't just any region. It is the Greater Yellowstone Ecosystem, with Yellowstone National Park at its wild heart. It has a national constituency. The public will demand answers and accountability; citizens will want to know the names of who was in charge and did little to prevent disaster from happening.

Part 2

Science, Public Lands, Wildlife
OCTOBER 17, 2017

America's National Elk Refuge: A 'Miasmic Zone Of Life-Threatening Diseases'
AS CHRONIC WASTING DISEASE LOOMS OVER GREATER YELLOWSTONE, THE EPICENTER OF A DEADLY OUTBREAK COULD BE WESTERN WYOMING. PART 2 OF MOUNTAIN JOURNAL'S IN-DEPTH LOOK AT A COMING WILDLIFE PLAGUE.
by Todd Wilkinson

A bull elk on the National Elk Refuge in Jackson Hole, Wyoming. Photo courtesy U.S. Fish and Wildlife Service
PART TWO

To nature-adoring onlookers, the sea of elk gathered every winter on the National Elk Refuge in Jackson Hole, Wyoming appears to be an enchanting vision of wapiti nirvana.

Across generations, countless people have taken refuge sleigh rides, watching thousands of pastured wild elk being fed dry hay and alfalfa pellets. Indeed, the town of Jackson, Wyoming's four rustic elk antler archways in its central public square are built from antlers shed by bull elk on the refuge.

Many readers here might reasonably wonder what could possibly be wrong with this tranquil picture? (see below). How could anyone question the magnanimous gestures of local folk and U.S. taxpayers offering these majestic creatures nutritional charity to get them through the snow season?

After all, many Americans put out corn and other grains for deer in winter on the sly, defying state laws against feeding yet believing they, too, are doing the animals a favor. In an age of Chronic Wasting Disease, looks can be perilously deceiving, scientists say.

As CWD rapidly expands its geographical reach in North America, those seemingly benign practices of feeding, experts warn, could be hastening disastrous consequences. And now, with the deadly pathogen already looming on the edges of Greater Yellowstone, the most iconic wildland ecosystem in the Lower 48, what does CWD's arrival portend for the region's unparalleled wildlife populations? Many epidemiologists see the National Elk Refuge as the place where an unstoppable pandemic would likely begin.

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Old-timers in Jackson Hole get emotional, even misty-eyed, when discussing why the sight of so many elk is part of their culture and sense of place. They see the feeding of elk in heroic terms, the result of ancestors stepping forward and rescuing a national animal treasure, similar to what happened when Theodore Roosevelt, William Hornaday and others emerged as saviors against the total annihilation of bison.

Artificial feeding at the Elk Refuge was initiated more than a century ago. Lying adjacent to the town of Jackson's northern boundary and situated between Grand Teton National Park and the Bridger-Teton National Forest, the refuge, the second of its kind for a large mammal in history, was itself born of a crisis.

Thousands of elk in winters leading up to 1912, when the first pieces of today's 25,000-acre Elk Refuge were officially put in place, starved to death on the flats north of town, causing a public outcry that stretched all the way to Washington D.C. In response, a campaign to acquire land accompanied by feeding cemented a perception that unless wapiti were given supplemental forage in Jackson Hole they would die in droves or disappear altogether.

All is not nearly as idyllic as it appears in this scene with tourists enjoying a sleigh ride across the National Elk Refuge in Jackson Hole, Wyoming. Scientists say the unnatural feeding of thousands of wintering wapiti has created ripe conditions for a catastrophic outbreak of deadly Chronic Wasting Disease. Photo courtesy National Elk Refuge
There is even an apocryphal tale about the die-off years, that a human could have walked on the backs of dead elk in the snow for more than a dozen miles and never had one's feet touch the ground.

The justification for feeding is based on the following rationale: because so much elk winter range in Jackson Hole has been covered by human development and because private ranches do not welcome elk, regarding them as unwanted competitors for grass consumed by cattle, the offering of alfalfa chow lines beyond what nature provides is essential.

Keeping wild elk reliant and semi-tamed on unnatural forage in fenceless feedlot conditions draws many—but not all of them—away from private property. This same rationale applies to 22 other state-run feedlots dotting the federal Bridger-Teton Forest, tracts administered by the Bureau of Land Management and state lands scattered across western Wyoming.

What the controversial feeding program stands in contradiction to, however, is the conclusion of virtually every major professional wildlife management organization which warns that bunching up animals fosters conditions that are ripe for deadly disease outbreaks.

Wyoming's rationale for feeding stands in contrast to other valleys across the West, including Greater Yellowstone's Madison Valley in Montana, where wild elk persist in abundance and are not given boosts of alfalfa pellets to keep them alive.

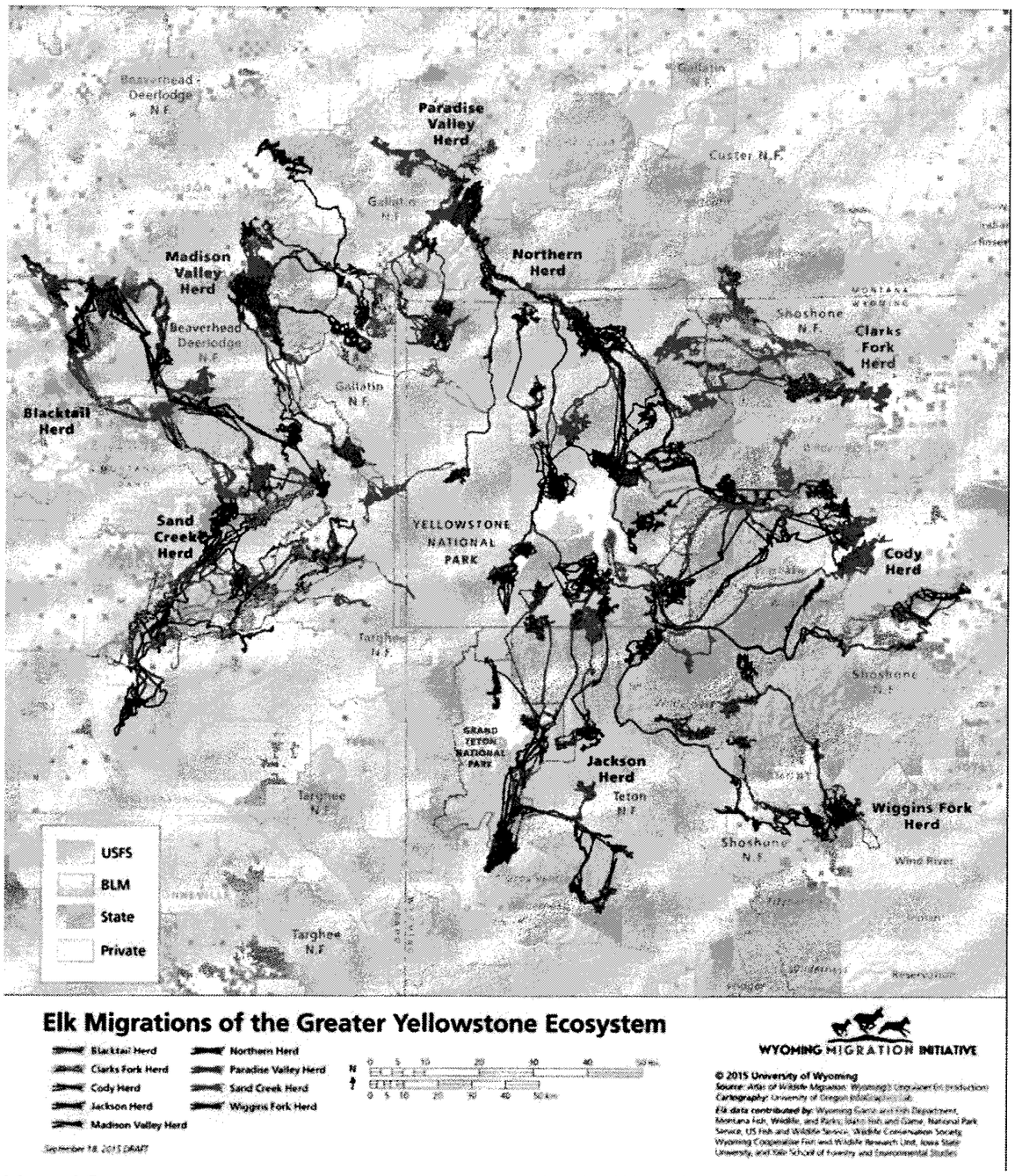
As of fall 2017, a CWD positive animal has not been detected on the Elk Refuge nor on any of Wyoming's widely ridiculed complex of feedgrounds, but CWD positive deer have been found nearby (see map below), and the clock is ticking.

At the Elk Refuge, another ecological consequence of feeding elk is wapiti no longer migrate out of Jackson Hole to lower elevations in winter as they did for thousands of years. Artificial winter feeding has suppressed that ancient instinct among many of the elk in western Wyoming; and yet, ironically, Wyoming celebrates elk migrations and makes them an object of scientific study and conservation priority through the Wyoming Migration Initiative.

It turns out that there are many aspects of how Wyoming manages wild elk— including the state's hostile attitude toward predators, which some experts consider an important line of defense in slowing CWD's spread— that are fraught with contradiction and hypocrisy, critics say. One of the herds, the Jackson Herd that winters on the Elk Refuge, has also been extolled as "America's Elk Herd" and is the most famous for the species in the world.

The abundance of public elk in Jackson Hole has represented meal tickets for generations of commercial hunting outfitters and guides and provided sustenance for local citizens putting wild meat in their freezers. Why change something that has worked well for them?

Elk start arriving on the National Elk Refuge and the state's unfenced feedlots in droves in November, pushed out of the mountains by deepening snows. Remaining until April, they disperse again to distant summer calving and autumn breeding grounds in the high country following green up. Many different herds from Wyoming converge upon the remote meadowlands in Yellowstone National Park located in the geographic heart of the ecosystem and mix with other elk herds migrating in from Idaho and Montana.



Map of Greater Yellowstone elk migrations created by the Wyoming Migration Initiative. Note how the Jackson Elk Herd shares summer range with other herds in Yellowstone National Park which, in turn, come in contact with other herds fanning out across the northern, western and eastern tiers of the Greater Yellowstone Ecosystem. This is one way scientists say CWD might quickly spread.

This massive consolidation of wintering elk in and around Jackson Hole and then the animals' subsequent summer intermixing has been likened by ecologists to the circulatory and pulmonary systems in a human body. Like breathing in and breathing out; like blood moving

through veins and arteries. It occurs nowhere else in the Lower 48 on the scale as it still does in Greater Yellowstone with large mammals. And, like an infection that may start modestly as merely a cut to an outer appendage, CWD has the potential to bring virulence to herds far away from the Elk Refuge and feedgrounds.

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As a result of unnatural feeding, elk numbers on the refuge and Wyoming feedgrounds have swelled far beyond their normal carrying capacity because normal winter mortality is lessened and because natural predators, namely wolves, had been eradicated. Wolves were restored to Greater Yellowstone in 1995 and there remains resentment toward lobos from outfitters who say any elk a lobo takes is one less for clients to possibly shoot.

A major concern expressed by ecologists, and a topic of fierce debate, is that by keeping elk on a nutritional dole and by eliminating predators that often target the sick and weak, it has actually eroded the hardiness of animals by allowing the frail and vulnerable to better persist; in other words, leaving herds even more susceptible to disease.

Declarations that wolves have had a devastating impact on elk in Wyoming are contradicted by three salient data points: first, by surveys from Wyoming Game and Fish that show most hunting units are at or above elk population objectives; second, by Elk Refuge managers who say the winter herd needs to be reduced by thousands of animals in order to prevent damage caused by overgrazing, and third, ironically, by outfitters who, on their own websites, boast of tremendous hunter success in selling guided hunts for thousands of dollars apiece, often to out of state clients.

An interesting footnote, which will be explored in depth later, is that some ranchers in Montana welcome wolves as allies on their property to scatter large numbers of wild elk converging on their pastures. In Wyoming, wolves are officially treated as vermin in over 85 percent of the state, with no more regard given to them than coyotes and rats, allowed to be killed for any reason, any time of day, even when they represent no conflict.

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Lloyd Dorsey, conservation director for the state chapter of the Sierra Club, passes by the Elk Refuge regularly. In fact, when I spoke to him recently, he was on his way to hunt big game in the Gros Ventre Mountains, passing by both the Elk Refuge and a state-run feedground on the Bridger-Teton National Forest called Alkali Creek. "I enjoy the challenge of fair chase. I like to eat wild game, and I look forward every fall to getting out there in the mountains," he says.

The National Elk Refuge is considered one of the flagships of America's national wildlife refuge system. Dorsey says the founding of the Elk Refuge was based, in part, on a creation myth, "a semi-fairy tale" about a rationale for feeding animals that doesn't hold up when subjected to scrutiny and well-established scientific truths.

Feeding elk made perfect sense at the dawn of the 20th century when no one knew what the ramifications were for disease and ecology. "I maintain the Elk Refuge was started, and state-run feedgrounds subsequently added during a time when our frontier society was far less enlightened in dealing with conflicts between wildlife, settlements, ranches and farms," he explains.

"One of the prevailing frontier-mentality options was killing off wildlife that was regarded as a competitor or threat to livestock; another was putting wildlife figuratively into boxes and, in this case, feeding elk like you would cattle in a pasture, semi-domesticating them. I get why it was

done. Feeding elk in the early 20th century made sense because it mitigated conflicts and kept more elk alive to hunt, eat, and make money from."

Originally, elk were nourished with supplemental feed at the beginning of the 20th century with the noble intent of saving herds from starvation. More than a 100 years later, scientists say such practices of bunching up animals creates ripe conditions for outbreaks of disease like brucellosis, deadly Chronic Wasting Disease and bovine tuberculosis
But Dorsey and many others say it should have been a short term solution, phased out when the science became clear decades ago. Recently, an official with the Wyoming Game and Fish Department admitted as much in a meeting with conservationists from Montana.

Still, due to political resistance, feeding has continued. Some rural Wyomingites today insist their "way of life" and financial livelihoods depends on state and federal governments spending millions annually to feed elk.

"In modern times, other states have figured how to co-exist with wild deer and elk on natural habitat, but, ironically, not three large public land counties in western Wyoming—[Teton, Sublette, and Lincoln]. Not yet, anyway," Dorsey said, noting that one of the real lingering justifications for feeding is to placate livestock producers, many of whom also graze their cattle on public lands at rates far below fair market value. Those same ranchers, while wanting their livestock to enjoy public grass, don't want to share their pastures with public wildlife."

"Intolerance toward free-ranging elk became official policy, and still is," Dorsey notes. He and others say there is still plenty of natural habitat on public land to sustain elk in western Wyoming without artificial feeding.

Big game hunters, especially Wyoming outfitters and guides who profit by giving clients higher hunter success achieved through inflated numbers of animals to harvest, have vigorously defended feeding at the same time denying that CWD is a serious issue.

Some vocal pro-feeding activists in Jackson Hole, like those arrayed around a group called Concerned Citizens for the Elk, have asserted, using Manichean logic, that it is better to keep feeding elk to prevent them from dying than stop feeding elk even though feeding leaves them highly vulnerable to catching a deadly non-eradicable disease. A local Jackson Hole veterinarian has even accused the Elk Refuge of deliberately starving elk whenever federal managers have made an attempt to reduce the amount of artificial feeding.

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Harold Turner is patriarch of a family that sells outfitting services and guided hunts on the Bridger-Teton National Forest. The Turner operation is based out of the Triangle X Guest Ranch in Grand Teton National Park, a tourist concession operation owned by the federal government. The Turner family sold the ranch to the federal government more than half a century ago, though it is a common misperception among Jackson Hole residents that the Turners still hold the deed.

Screenshot of Jackson Hole outfitter and guide Harold Turner giving interview to filmmaker Danny Schmidt in his documentary Feeding The Problem. Mr. Turner vigorously opposes shutting down artificial feeding of elk.
Mr. Turner has long opposed cessation of feeding elk. "If the elk feeding grounds were shut down, we would not only lose our base, our economic base, but we will lose our heritage," he

claimed on camera in filmmaker Danny Schmidt's acclaimed documentary Feeding the Problem that examines the feedground dilemma.

Wyoming's ongoing motivation for doing all it can to halt the proposed elimination of feedgrounds is no mystery. Elk and deer hunting generates tens of millions of dollars for the economy of gateway communities in Greater Yellowstone.

By the numbers, the amount of money generated annually by selling guided elk hunts in Greater Yellowstone is a small fraction within the overall pie of income generated through non-consumptive nature tourism in northwest Wyoming. Meanwhile, the number of big game hunters continues to dramatically decline nationwide in America, exacerbating the sense of desperation among outfitters and guides that their tradition is fading away with changing times. And it does not bode well for the Wyoming Game and Fish Department that gets operating revenue from the sale of hunting licenses.

One hunting outfitter and guide in Jackson Hole, without offering any scientific data to substantiate his contention, claimed CWD is merely a "bogeyman" disease. That same individual has also claimed that wolves would devastate wildlife, an assertion proved by facts to be false.

Concerned Citizens for the Elk has taken out full-page ads in the Jackson Hole News & Guide trying to call into question the science of infectious disease.

Harold Turner suggested on film that the most prudent strategy for dealing with CWD is to wait until it arrives rather than taking preventative action such as closing down the feedgrounds. Fellow rancher and hunting outfitter/guide Glenn Taylor, also interviewed for Schmidt's documentary, chose to deny the science of wildlife epidemiology.

"I've been asked about Chronic Wasting Disease before and I don't think it's as serious as they try to make you think," Taylor told Schmidt. "Maybe today there's too much scientific demand [reliance on science]. Maybe we need to manage from the seat of our pants is a good term, I think. Let the animals kind of do their thing. We may be better off than trying to initiate or use too much science to manage maybe what science shouldn't be doing that."
"Maybe today there's too much scientific demand [reliance on science]. Maybe we need to manage from the seat of our pants is a good term, I think." Jackson Hole rancher, hunting outfitter and guide Glenn Taylor, saying science shouldn't be the prevailing factor in determining how to manage elk.
In fact, Wyoming and the Elk Refuge stand accused by scientific experts as managing wildlife by the seat of its pants and critics assert that if wildlife were left to do its own thing, as Taylor suggests, feedgrounds would be shut down for the good of the public herds.

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To willfully ignore 21st century, peer-reviewed research, conservationists like Dorsey note, is to embrace ignorance, the kind of thinking that prevailed during the era of bloodletting in the Dark Ages.

CWD is not the only example of science—which does not comport with politics, culture and the agenda of special interests—being rejected in Wyoming. From members of Congress to state legislators and the governor on down to local school boards and chambers of commerce, many of Wyoming's elected officials also deny human-caused climate change is real and that carbon emissions being sent into the atmosphere by the burning of Wyoming coal is a problem.

They deny the clear body of evidence showing that domestic sheep spread deadly diseases to wild mountain sheep (bighorns); they deny data showing both the ecological and economic value of predators (wolves, grizzlies and other species, even bobcats) in the ecosystem; they deny data showing the severe impacts of energy industry disturbance on sage-grouse habitat; and they deny the profound role that conserving federal public lands, by keeping them in an undeveloped condition, plays as a positive sustainable engine of prosperity and enhanced quality of human life.

In his book, Pushed Off The Mountain, Sold Down The River: Wyoming's Search For Its Soul, writer Samuel Western takes note of a prevailing cultural belief among Wyoming citizens. They are convinced that Wyoming exists as an exception to laws of nature which apply to every other place in the world. That mentality is known as "the Wyoming way" and it holds the conviction that by denying truth, one can alter reality.

Except, as Dorsey notes, it doesn't. It certainly doesn't apply to Wyoming's defiance of prevailing scientific conclusions related to feedgrounds and CWD. Glenn Hockett, a lifelong sportsman and volunteer leader of the Gallatin Wildlife Association in southwest Montana, claims that Wyoming's incalcitrant stand toward feeding threatens not only the health of wild ungulates in Greater Yellowstone but all of the northern Rockies.

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On January 20, 2017, Eric Cole, a longtime Elk Refuge senior biologist, delivered a corroborating shot across the bow. Cole circulated information via email to wildlife colleagues and interested citizens that left many shocked. Cole's informal report stated that CWD "infection in the Jackson elk herd is inevitable and possible at any time."

Verbatim, his written assessment: "Population modeling predicts a wide range of CWD prevalence and effects on Jackson elk herd population growth rates in the short term (within 5 years) following introduction of the disease, but in the long term the effects of CWD on the health of the Jackson elk herd and recreational opportunities dependent on the Jackson elk herd will likely be significant and negative. For example at any level of CWD prevalence, current levels of cow elk harvest could not be sustained. The current supplemental feeding regime will exacerbate the effects of CWD on the Jackson Elk Herd because elk density at NER far exceeds elk density reported at Rocky Mountain National Park, which was the source of the annual infection rate used in the model.

"Elk are fed on the same 5,000 acres of [the National Elk Refuge] each year, and given the persistence of CWD prions in the environment, these areas will likely become heavily contaminated with the CWD prion over time if status quo management continues. 60-80% of the Jackson elk herd use NER feedgrounds each winter, which will regularly expose these elk to CWD prions at these sites. Various elk migration studies and research on another disease prevalent on [the National Elk Refuge], (brucellosis), suggest that the current feeding regime and its associated high concentrations of elk could be a source of CWD infection for cervids throughout the Greater Yellowstone Ecosystem."

Cole's blunt acknowledgment, contradicting Wyoming's sanguine stance, repeated warnings made by a number of his predecessors who spent careers in Fish and Wildlife Service uniforms.

Former Elk Refuge chief managers Mike Hedrick and Barry Reiswig noted as far back as the 1990s that CWD's arrival in Greater Yellowstone was certain and that its spread would be exacerbated by the feeding of elk.

Reiswig was roundly attacked by Wyoming outfitters, guides and politicians as being alarmist. His opinion, however, was backed up by veterinarian Thomas Roffe who presided over wildlife health issues for every national wildlife refuge in the country. It was highlighted, too, in an acclaimed book by Cole's predecessor, former senior Elk Refuge biologist Bruce Smith, titled "Where Elk Roam: Conservation and Biopolitics of Our National Elk Herd."

"I know the national and regional offices of the Fish and Wildlife Service were well aware of the concerns because in the 1990s I helped Mike Hedrick draft a letter informing them," Smith told me.

A 30-year top-level official with the Fish and Wildlife Service, now retired and who asked not to be identified, added this, "I recall briefings by Roffe when we met as Regional Refuge Chiefs. Also a meeting in Jackson Hole at the Elk Refuge where we heard about the feeding program-seems like a bad idea that should have been stopped long ago. But, long-standing feeding programs like these can be incredibly difficult to dislodge," he said. "I've wondered about the impact on hunting in the region but the ecological impacts are even more concerning."

Trepidation about disease and ecological impacts of having too many elk were brought to the attention of Jackson Hole's own John Turner, who served as national director of the Fish and Wildlife Service and is the brother of Harold Turner and who grew up on the Triangle X Ranch. "John Turner knew. He knows today [of the dangers of feeding elk] but he's never spoken up," Smith said.

Both Roffe and Smith live today in Montana while Reiswig is a retired civil servant and backcountry horseman in Cody, Wyoming. All three, in varying ways, took their own agency to task, saying the Elk Refuge was wintering far too many wapiti, not only setting the stage for disease outbreaks but causing ecological damage that was negatively affecting habitat for other species because of elk overgrazing and over browsing vegetation.

Dr. Thomas Roffe, left, is the former national chief of wildlife health for the U.S. Fish and Wildlife Service and Bruce Smith, right, spent more than half of his career as a senior researcher and wildlife biologist at the National Elk Refuge. Both Roffe and Smith warn that CWD and feeding elk have all the makings of zoonotic disaster. Photos courtesy "Feeding the Problem"

As Reiswig once told me, there is profound irony: if ranchers' domestic cows were causing the same kind of negative ecological impacts on their public land allotments as elk on the National Elk Refuge were, ranchers would be reprimanded and possibly lose their grazing permits.

John Turner did nothing to press his agency, at least publicly, to reduce feeding. He was Fish and Wildlife Service director under President George H. W. Bush. Later, he served as the assistant Secretary of State for Oceans and International Environmental and Scientific Affairs for President George W. Bush from 2001 to 2005. Intriguingly, during the latter tenure, some of Turner's areas of involvement on behalf of the U.S. government were dealing with science, climate change, biodiversity and infectious diseases, including zoonotic threats, i.e. diseases shared between humans and animals.

After leaving civil service, Turner became a trustee for Peabody Energy, the largest coal producer in the U.S., which has been part of efforts to cast doubt on the science of climate change. He also was a board member of Ashland Energy, a global chemical and oil and gas conglomerate, leaving some to question his conservation values and espoused belief in wildlife

management being driven by science, a fundamental pilar of the North American Model of Wildlife Conservation.

It is described by The Wildlife Society this way: "The North American Model recognizes science as a basis for informed management and decision-making processes. This tenet draws from the writings of Aldo Leopold who in the 1930s called for a wildlife conservation movement facilitated by trained wildlife biologists that made decisions based on facts, professional experience, and commitment to shared underlying principles, rather than strictly interests of hunting, stocking, or culling of predators. Science in wildlife policy includes studies of population dynamics, behavior, habitat adaptive management, and national surveys of hunting and fishing."

Smith said there is no federal law that orders the Fish and Wildlife Service to feed elk at the Elk Refuge. Efforts to curtail feeding could be initiated by the agency's national and regional directors or by the Interior Secretary who presently is Ryan Zinke, a Montanan, who insists he is devoted to wildlife conservation.

Ostensibly, no Fish and Wildlife Service director in history had a more intimate grasp of the issue than John Turner. In his defense related to his failure to intervene, which he could have pushed to do, no action was taken during a succession of Fish and Wildlife Service directors serving both Republican and Democrat presidential administrations.

Bruce Smith says he gave Turner's successor, Jamie Rappaport Clark, today president of the national conservation group Defenders of Wildlife and an appointee of Bill Clinton, a tour of the Elk Refuge when she was Fish and Wildlife director in the 1990s and she understood the wildlife health issues in play. "She went back to Washington with a small elk antler that she found during her visit and I hoped it would be a reminder," Smith said.

Clark told me in an interview a few years later that she tried to bring reforms. The refrain has always been that as long as Wyoming is opposed, the ending of feeding will never happen. Even a stinging rebuke in court to the Fish and Wildlife Service, a lawsuit brought by Defenders and other conservation groups, and supported by Clark against her former federal employer, has not broken the inertia.

In 2008, the environmental law firm EarthJustice and its lead attorney Tim Preso sued the Fish and Wildlife Service on behalf of Defenders, the Greater Yellowstone Coalition, Jackson Hole Conservation Alliance, Wyoming Outdoor Council and the National Wildlife Refuge Association over management plans for elk and bison on the refuge.

The Fish and Wildlife Service, instead of heeding the expert opinions of its own senior staff, opted instead to essentially maintain the status quo. The plaintiffs charged that the Fish and Wildlife Service, in an environmental impact statement addressing the consequences of feeding, failed to both adhere to federal law or try to mitigate the jeopardy it was causing to wildlife under its care.

During those proceedings the groups highlighted irrefutable damning evidence pointing to a real and imminent threat to elk and the fact that the Fish and Wildlife Service was managing the refuge in violation of two laws. Even though staff made the dangers clear, senior agency administrators overruled them. "In its final decision... the Service reversed itself, elevating the political preferences of Wyoming over the biological needs of the Refuge and its wildlife populations. In so doing, the Service acted arbitrarily and unlawfully," Earthjustice wrote. "The whole point of a National Elk Refuge is to provide a sanctuary in which populations of healthy, reproducing elk can be sustained. The Refuge can hardly provide such a sanctuary if, every winter, elk and bison are drawn by the siren song of human-provided food to what

becomes, through the act of gathering, a miasmic zone of life-threatening diseases." —opinion of DC Circuit Court in noting how the Fish and Wildlife Service violates its own laws
The DC Circuit Court delivered this stinging assessment of facts to Interior Secretary Ken Salazar in President Barack Obama's cabinet: "The whole point of a National Elk Refuge is to provide a sanctuary in which populations of healthy, reproducing elk can be sustained. See 16 U.S.C. § 673a (creating a "refuge" for the elk). The Refuge can hardly provide such a sanctuary if, every winter, elk and bison are drawn by the siren song of human-provided food to what becomes, through the act of gathering, a miasmic zone of life-threatening diseases."

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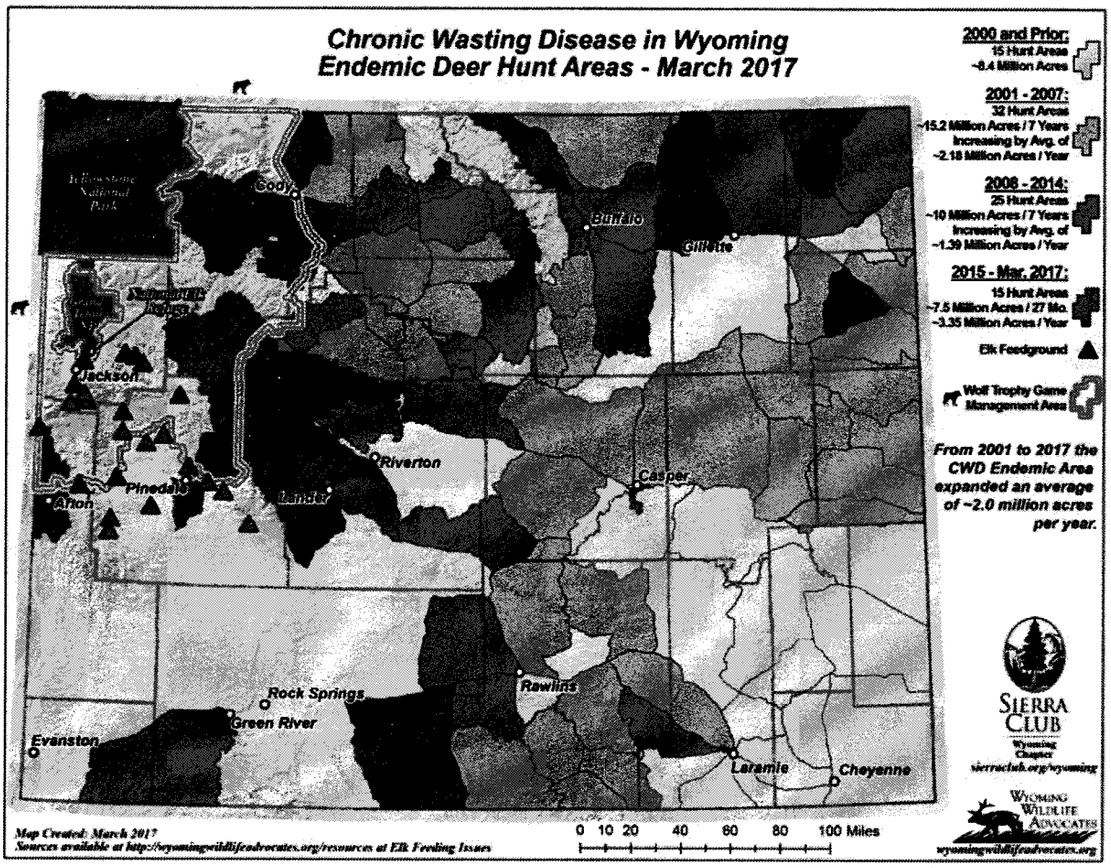
Lloyd Dorsey works during the day as a professional conservationist. During his time off, he loves to hunt.

Dorsey is a headstrong individual and arguably no professional non-governmental conservationist has been more focused on CWD in the ecosystem than him. Prior to working for the Sierra Club, he was on the staff of the Greater Yellowstone Coalition, an organization that has been virtually—and oddly— silent on CWD since Dorsey's departure. Mike Clark, the Greater Yellowstone Coalition's former executive director, said he admires Dorsey and gave him latitude to tackle CWD because wildlife diseases rank among the paramount issues threatening the ecological integrity of Greater Yellowstone, he said. Dorsey left the Greater Yellowstone Coalition after Clark retired.

Conservationist Lloyd Dorsey, interviewed in Danny Schmidt's Feeding the Problem
"Lloyd has been doggedly persistent. He can be a burr in the side of people who would rather just look the other way. He won't quit because he knows there's just too much at stake and it's one of those situations where the more you know, the more that you can't let it go," Clark explains. "In Greater Yellowstone we've got one of the largest concentrations of migratory wildlife left in the world. When you have a state like Wyoming knowingly destroying a public resource in order to provide commercial gain for a relatively few number of people, that's a travesty." [Editor's note: Clark, also a former journalist, serves on the board of Mountain Journal].

CWD was first detected in Wyoming mule deer in 1985 and it was confirmed in elk a year later. Using data compiled by Wyoming Game and Fish, maps created by the Sierra Club and Wyoming Wildlife Advocates have tracked the steady progression of CWD. The maps show a growth in the number of CWD endemic zones and an advance of disease-positive deer, which are the flag species.



CWD was first diagnosed in southeastern Wyoming (marked in yellow) and over the last three decades has expanded in deer herds. The disease is now bearing down on the Greater Yellowstone Ecosystem in the northwest corner of the state and pressing up against the states of both Montana and Idaho. The location of Wyoming's 22 elk feedgrounds are marked by red triangles. The National Elk Refuge is located just south of Yellowstone National Park and east of Grand Teton National Park. Map courtesy Wyoming Chapter of the Sierra Club and Wyoming Wildlife Advocates

Until the year 2000, CWD was present in 15 Game and Fish hunt areas in the southeast quadrant of the state encompassing about 8.4 million miles. In the next seven years it was in 32 additional hunt areas covering more than 15 million acres on a westward path. Between 2008 and 2014, it added another 25 hunt areas and 10 million acres or about 1.39 million acres annually pushing into the middle of Wyoming.

From November 2015 to November 2016—just a single year—the CWD endemic zone grew 3.31 million acres and is now on the verge of reaching Yellowstone, Grand Teton, the Elk Refuge and the state feedgrounds.

The addition of Deer Hunt Area 17 (mentioned in part 1 of this series) made nine new areas in Wyoming in 2016 whereas the annual average between 2001 and 2015 was four new areas. An emerging hotspot is a hunt area south of Pinedale, Wyoming, on the flanks of the Wind River Mountains and a short jaunt away for a mule deer to the feedgrounds.

Something else worth noting: mule deer numbers in the southern end of Greater Yellowstone are already in serious decline, caused not by CWD or wolves but the impacts of energy development pushing them out of optimal habitat, leaving them more weakened and with less reproduction success. What extra burden does CWD represent to these herds? For Dorsey, a bigger unknown is how it will manifest in elk.

"If CWD takes hold in these elk populations of western Wyoming on the two dozen feedgrounds and then starts to spread as those animals, in turn, disperse more widely in the spring, mixing with other herds scattered across the tri-state area [Wyoming, Montana and Idaho], I don't think anyone knows what will happen, but it can't be good," Dorsey says.

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More than 10 years have passed since the Elk Refuge's initial 2007 EIS decision, and it still lacks a firm plan to meet its requirement of managing for healthy wildlife and habitat. If anything, attempts to address feedgrounds have gone in reverse and at the worst time, with CWD endemic zones creeping inside Greater Yellowstone. The Fish and Wildlife Service isn't the only agency being criticized as an accomplice to disaster.

In June of 2017, the Forest Service was sued by the Sierra Club, Western Watersheds Project, Wyoming Wildlife Advocates and Gallatin Wildlife Association after it issued a permit allowing Wyoming to continue operating the Alkali Creek Feedground on the Bridger-Teton Forest east of the Elk Refuge near the Gros Ventre Wilderness and Gros Ventre River.

Forest Service biologists have admitted that the Gros Ventre Valley, a side dell to Jackson Hole, can, during mild to average winters, support 3,000 elk on natural forage without human nutritional assistance. That's on top of the thousands of elk that similarly could be wintered at the Elk Refuge. Poignantly, Bridger-Teton officials acknowledged the Alkali Creek Feedground "could become a reservoir for CWD infection."

Readers who are not students of the federal-state relationship involving public land management might not realize that while federal lands provide large expanses of habitat for wildlife, much of the management of the animals themselves fall under state purview. One exception is wildlife protected under the Endangered Species Act.

However, federal agencies are required to assess the impacts of activities occurring inside their boundaries, whether those activities are proposed by private interests or other government entities. Wyoming's feedgrounds, given number of sites and animal numbers involved, could be categorized as an industrial strength operation.

By federal law, the Forest Service is legally mandated to manage for wildlife health. When the Forest Service conducts environmental analyses on, say, a proposed logging or energy development, the National Environmental Policy Act and the National Forest Management Act require that individual forests weigh the impacts on wildlife.

When the Bridger-Teton was deciding whether to greenlight a new permit for the Alkali Creek Feedground, Dorsey and others submitted multi-page written comments highlighting scientific documents and expert opinions of researchers to Bridger-Teton Forest Supervisor Tricia O'Connor and her staff. O'Connor acknowledged in her decision of record in December 2015 that one of the main reasons she approved feeding was basically to keep elk addicted to artificial feed so they wouldn't end up migrating across private ranchlands and potentially exposing cattle to disease. She used the same rationale that was invoked when the Bridger-

Teton granted permits to continue five other state-run feedgrounds on Forest Service lands in 2008. CWD is much closer to the feedgrounds now than it was in 2008.

Why does the Forest Service continue to issue permits to Wyoming Game and Fish for feeding elk when the science outlining the dangers of feedgrounds compounding a dire disease threat to wildlife is clear, conservationists ask.

Preso points out identical contradictions in the lawsuit against the Fish and Wildlife Service. Federal judges agreed with him. Such guidance is especially clear in the National Wildlife Refuge System Improvement Act passed by Congress and signed into law by President Clinton in 1997. It is essentially an "Organic Act" for the Fish and Wildlife Service and instructs the agency to manage for the optimal welfare of the species on refuge lands.

The Bridger-Teton also appeared to ignore the fact that the D.C. Circuit agreed with conservationists that its federal neighbor, the Elk Refuge, had violated federal laws by not taking action to address the looming disease risk.

So, here is a question that could be logically posed: How is the menace of CWD possibly polluting Greater Yellowstone's wildlife with a fatal pathogen, capable of causing toxic contamination in the environment, any different from, say, a private company's proposed hard rock mine if such a project has the potential to damage a public waterway with harmful tailings?
So, here is a question that could be logically posed: How is the menace of CWD possibly polluting Greater Yellowstone's wildlife with a fatal pathogen, capable of causing toxic contamination in the environment, any different from, say, a private company's proposed hard rock mine if such a project has the potential to damage a public waterway with harmful tailings?
If a mine were shown to have a high probability of fouling a trout stream or drinking water supply, there is no doubt the permit would be denied. Except, in the case with Wyoming feedgrounds, these are government agencies legitimizing their own known violation of federal laws specially enacted to protect wildlife health; moreover, they abrogate the very tenets of the public trust doctrine pertaining to wildlife as spelled out in the North American Model of Wildlife Conservation, Preso says.

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Does Wyoming know better? The unequivocal answer is yes.

During the late 1980s, Wyoming rancher Thomas Dorrance, best known for being an heir to the family that created Campbell's Soups, pressed to open a game ranch for exotic wildlife near Sundance, Wyoming.

Dorrance wanted to create a Texas-style fenced-in compound on about 4200 acres inside his 17,000-acre ranch. Among the possible species were non-native Russian boar, red, roe, sika, axis and fallow deer, ibex, chamois, Barbary, mouflon and Marco Polo sheep. Native animals such as elk, moose, pronghorn and bighorn sheep would also have been part of Dorrance's menagerie and featured in a drive-through wildlife park, harvested for meat production, traded and sold as breeding stock, and some made available to hunters.

As a young policy analyst in Canada, Darrel Rowledge came under the tutelage of Dr. Valerius Geist and others who initially welcomed game farming but quickly changed their views in the wake of several disease outbreaks including brucellosis, bovine tuberculosis and in recent years CWD. (We will explore what happened there later in this series).

Rowledge, today director of the Alliance for Public Wildlife in Calgary, is intimately familiar with the controversy that ensued over Dorrance's proposal. "When Dorrance submitted his application, Tom Thorne and Beth Williams responded by saying 'You're going to do what? Put wildlife in confinement, create a massive disease factory? Not in Wyoming, you're not.'"

How does Rowledge know this? He was invited down to Cheyenne from Canada to provide briefings to Wyoming wildlife officials and lawmakers on the dangers of game farms, this following outbreaks of disease in Alberta and Saskatchewan.

For many years Dr. Thorne served as Wyoming's chief wildlife veterinarian and his wife, Dr. Beth Williams, was a widely respected CWD researcher who worked with Dr. Mike Miller, a nationally-renowned researcher in Colorado. Their concerns were shared by Robert Lanka of Wyoming Game and Fish who was lead author of a report titled "Analysis and Recommendations on the Application by Mr. John T. Dorrance III to Import and Possess Native and Exotic Species."

Wyoming officials, their decision based largely on the findings of Lanka, Thorne, Williams and world-class consulting colleagues, turned down Dorrance's permit application.

"We've got three or four options. We can accept it, we can take it into the court system, attack it legislatively to seek some changes in the Wyoming statutes or a combination of the last two," Dorrance, angered by the decision, told a reporter. "If we pursue it [a court challenge] and win we are still faced with the Wyoming Game and Fish Department. They might be very bitter and vindictive. They could make our life impossible."

Ultimately, Dorrance sued the state—and lost. "Wyoming's justification withstood every single challenge. It was the only government that ever did a comprehensive cost-benefit analysis on the dangers of game farming and congregating wildlife," Rowledge told me. "It was the overwhelming conclusion, based on the best of the best scientific minds, that it would be a disaster."

Wyoming Game and Fish Commission President Don Scott said at the time, defending the state's position: "We have wild and free-ranging herds that are truly a national treasure and we just don't believe that that treasure should be placed in jeopardy, even a remote jeopardy. We don't want to turn Wyoming into Texas."

Thorne and Williams, members of the Wildlife Disease Association, died tragically in a traffic accident in 2004.

Rowledge argues that Wyoming over the past 25 years has lost its way. "It's kind of crazy what the state position is today on keeping feedgrounds open. In terms of what they do, there's really no difference between them and game farms, except the feedgrounds involves larger numbers of animals and public wildlife that is free-ranging," he said.

Still, he remembers Drs. Thorne and Williams with fondness. "I have tremendous respect for them. They were willing to alter their perspective in accordance with new scientific discoveries," he said. "Had they lived, and were they to know what we do today about CWD, I have no doubt they would conclude that operating the feedgrounds is a terribly bad idea."

More than a quarter century ago, around the same time that the Dorrance case was playing out, another one hit the courts. This one involved a trial and the Parker Land & Cattle Company near Dubois. It had filed suit for damages after its domestic cows became infected with brucellosis and were ordered destroyed. The plaintiff's lawyer was former Wyoming Governor and Interior Secretary Stan Hathaway who foreshadowed the opinion of the D.C. Circuit Court

two decades later. Hathaway referred to management practices at the Elk Refuge and, by association, the state feedgrounds as "a cesspool of disease."

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Where is Wyoming Gov. Matt Mead, who has been in office since 2011 and is serving out the remainder of his last term? By his record, he has dodged action just like many of his predecessors along with the Game and Fish Department under his command. He says elk would perish in vast number if feedgrounds were abruptly shuttered but former Elk Refuge biologist Smith notes that no one has proposed closing them cold turkey. Instead, he and others have proposed reducing feeding incrementally over a span of years until elk numbers reach carrying capacity in accordance with available natural habitat.

Dinners around the Thanksgiving table in Jackson Hole must be interesting ones for the Mead family when the topic of CWD comes up. Just as the conversations must be colorful between John Turner, who holds a master's degree in wildlife biology, and his brother, Harold.

Gov. Mead grew up in Jackson Hole and is the grandson of former governor and U.S. senator Cliff Hansen. At the start of Danny Schmidt's documentary Feeding the Problem, Mead's older brother, Jackson Hole rancher and attorney Brad Mead, was interviewed. He caught flack from some in the community for being forthright about his views on CWD. Over the years whenever I've interviewed him, I've found him to be smart, articulate and well-read. An amateur astronomer, he believes in science.

"From what I've heard about Chronic Wasting Disease, it's not a pretty thing to watch," Brad Mead told Schmidt on camera. "I have to believe that tourism would suffer a lot if people driving by on the highway past the Elk Refuge saw animals dying from Chronic Wasting Disease in the hundreds or the thousands."
"From what I've heard about Chronic Wasting Disease, it's not a pretty thing to watch. I have to believe that tourism would suffer a lot if people driving by on the highway past the Elk Refuge saw animals dying from Chronic Wasting Disease in the hundreds or the thousands." — Jackson Hole rancher Brad Mead, older brother of Wyoming Gov. Matt Mead
Brad Mead at the end of Feeding the Problem says the compelling science persuaded him that feedgrounds need to be phased out, admitting it will be far better for elk and the ecological health of the region over the long run.

"I don't have a huge issue with brucellosis as a disease. I don't think most cattle producers are that panicky about brucellosis and I don't think most outfitters are panicky about brucellosis but Chronic Wasting Disease, that's a whole 'nother deal," Mead said. If CWD turns up in the Elk Refuge, he believes it could be "a biological crisis of the first order."

Picture this hypothetical scenario playing out in Jackson Hole along U.S. Highways 89/191, a possibility imagined by both Bruce Smith in his book and by Brad Mead in Schmidt's documentary: sharpshooters on the Elk Refuge enlisted to basically destroy a significant percentage of the most iconic elk population in America to contain a pathogen. Wapiti would have to be mowed down and removed in order to prevent the refuge from turning into a massive contamination zone.

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Greater Yellowstone is supposed to be an American beacon for smart custodianship of America's public lands, and it's fair to say many Americans believe it to be true. But the

feedground controversy has numerous negative ripple effects and is laden with epic levels of hypocrisy, Preso notes.

For example, the Elk Refuge continues to feed elk that during some winters are in numbers 50 percent over its own management objectives. Right next door across an artificial boundary in Grand Teton Park, park officials sanction a controversial elk hunt inside the national park boundaries (the only one of its kind in a U.S. national park) to reduce the number of elk.

That, in turn, causes dangerous encounters between hunters and grizzly bears. In fact, the Fish and Wildlife Service, which oversees management of the Elk Refuge and until recently was in charge of managing imperiled grizzly bears, said it fully expects that bears will die in run-ins with elk hunters inside Grand Teton.

Ironically, Wyoming Game and Fish assembled a CWD action plan in 2016 and put it out for public review. The state offered only vague generalities for how it will respond when disease strikes the feedgrounds yet the plan included these acknowledgments:

"Disease transmission can be related to density of animals in a given area as well as the frequency of contact between animals. Artificially concentrating elk on feedgrounds may result in more rapid spread of CWD and contribute to increased persistence of prions in the soil and uptake by vegetation. Based on WGFD hunter-harvested CWD surveillance data, CWD prevalence levels in non-fed elk populations remain significantly lower than those of sympatric mule deer and white-tailed deer populations in the core endemic area of Wyoming."

The report added that "recent modeling based on a combination of captive and free-ranging elk data suggested that feedground elk may survive in the face of CWD at significantly reduced numbers through a combination of genetic selection and elimination of antlerless elk harvest."

Moreover, the department stated that "even though [CWD] eradication is not feasible at this time, the WGFD will consider management actions to slow the spread and/or reduce the prevalence of the disease statewide, especially west of the Continental Divide, based on accepted scientific information and wildlife management practices."
"I don't know that anything else exists with management policy in the Greater Yellowstone Ecosystem so blatantly contrary to the science, the law and common sense and involves a state that is so resistant to change." —Tim Preso, attorney with environmental law firm EarthJustice
Like the Fish and Wildlife Service and Forest Service, Dorsey notes that Wyoming cites the science and then willfully disregards it.

In a career of practicing environmental law, Preso says that seldom has he encountered more egregious mismanagement from government land and wildlife agencies—state and federal working together. "I don't know that anything else exists with management policy in the Greater Yellowstone Ecosystem so blatantly contrary to the science, the law and common sense and involves a state that is so resistant to change," he said.

What is the truth no one is willing to publicly admit? Politicians in Wyoming fear that if they support closing the feedgrounds, they won't get elected. It's no different from being a politician in a coal-producing state and denying human-caused climate change or coming from a tobacco-growing state and refusing to publicly acknowledge that smoking cigarettes causes cancer.

But it's more than that: many don't want to say anything that challenges the beliefs of culture, whether based on fact or not. There is huge pressure in local communities to conform to the status quo or face shunning and being socially ostracized.

Eventually, Preso says, truth prevails and with CWD he fears it will only emerge from a preventable crisis.

For now, he wants to know why federal civil servants working for the Fish and Wildlife Service and Forest Service would knowingly break the law. Further, why would Wyoming knowingly shirk science?

Another profound irony that will be explored later in this series is that Wyoming's state wildlife research facility at Sybille Canyon along the foot of the Laramie Mountains was renamed the Tom Thorne/Beth Williams Research Center. There, an experiment involving CWD and elk confirmed just how lethal the disease risk is but a Wyoming veterinarian minimized its dire implications.

Darrel Rowledge recalls having conversations with Thorne and Williams about the public trust doctrine and the precautionary principle, the latter being a governing tenet to err on the side of caution when dealing with consequences of possible actions that could prove catastrophic.

Nameless, faceless bureaucrats don't make decisions, he says. Individual people do. Rowledge points to recent criminal charges involving public officials and an outbreak of Legionnaires' Disease, a bacterial disease, in and around Flint, Michigan. The assertion is that the disease outbreak can be traced to known problems with the city's water supply that those in charge of public health agencies ignored.

"Governments and individual people that dare to ignore the precautionary principle and public trust doctrine can face criminal charges," Rowledge said. "Could it happen with those who look after the welfare of public wildlife? Could it happen if one day people come down with a prion disease caused by eating a CWD-infected deer or elk? Who will be called to answer when injury comes to the public good and those in charge are shown to have either ignored the truth or looked the other way?"

Part 3

Chronic Wasting Disease, Yellowstone, Public Lands, Wildlife
NOVEMBER 16, 2017

Chronic Wasting Disease Strikes Montana And Continues Its March On Yellowstone
AS WYOMING CONTINUES TO DENY THE THREAT POSED BY FEEDGROUNDS, CRITICS SAY FEDERAL AND STATE AGENCIES DEMONSTRATE EPIC DYSFUNCTION FOR THEIR LACK OF A COORDINATED PLAN
by Todd Wilkinson

PART THREE:

At the Wyoming Game and Fish Department, officials there have made it abundantly clear they frown upon "the celebritization" of wildlife. Over the years, field personnel have been dismissive whenever members of the general public have given individual animals nicknames, such as the case with famous grizzly bears in Jackson Hole.

Game and Fish managers insist that naming wildlife causes humans to anthropomorphize animals, and it puts too much emphasis on individuals when the department, they say, is devoted to stewarding species at the population level.

Not long ago, Game and Fish researchers broke their own rule when they bestowed a moniker on a wild wapiti mother kept in captivity. She wore ear tag No. 12 and they dubbed her "Lucky".

Lucky was born a wild cow elk who initially survived a close brush with doom. For those studying Chronic Wasting Disease, she represents either a cryptic symbol of hope for the persistence of elk in the Greater Yellowstone Ecosystem, or, in the eyes of scientists thinking about zoonotic diseases, a frightening potential harbinger.

In 2002, 39 healthy elk calves were captured at the National Elk Refuge in Jackson Hole, Wyoming and transported across the state to a research facility at Sybille Canyon near the town of Wheatland. There, the young ungulates were placed in pens.

Over the course of a decade, every single one contracted CWD and perished—all except for Lucky.

The rate of CWD's lethality, involving wapiti guinea pigs like these, speaks to the disease's virulent progression especially among deer family members grouped in tight quarters and exposed to disease. Similar outcomes have been mirrored in game farm settings involving captive privately-owned deer and elk.

While mortifying, the high casualty rate at Sybille was not the most disconcerting aspect of the experiment overseen by wildlife veterinarian and researcher Dr. Brant Schumaker.

"Lucky" the cow elk, pictured here at the state-run Thomas Thorne/Elizabeth Williams Wildlife Research Center at Sybille, Wyoming. Lucky then, in 2015, was a CWD survivor, 13 years old and weighing 600 pounds. Photo: Wyoming Game and Fish Department
Sybille is a facility named in honor of two of Wyoming's best-known modern wildlife researchers, the late husband and wife team of Drs. Thomas Thorne and Beth Williams. Ironically, the late Dr. Thorne, who served as Wyoming's state wildlife veterinarian, once chastised conservationists, branding them alarmists for raising concerns about CWD and calling for Wyoming's feedgrounds to be mothballed. He asserted the disease would spread slowly across the state of Wyoming and likely would have modest impacts on elk compared to deer.

Time, however, has already proved some of those sanguine predictions made by Thorne and others to be wrong. CWD is actually spreading more rapidly across North America than many thought possible and it is leaving behind a lethal trail.

So concerning is CWD among hunters and others in America that this fall there's been a national shortage of test kits available for hunters to collect samples from game animals they have harvested and send them into labs for analysis. The federal Centers for Disease Control recommends that all ungulates killed in CWD-endemic areas first be tested before meat is eaten and states say that any sick animals should be discarded.

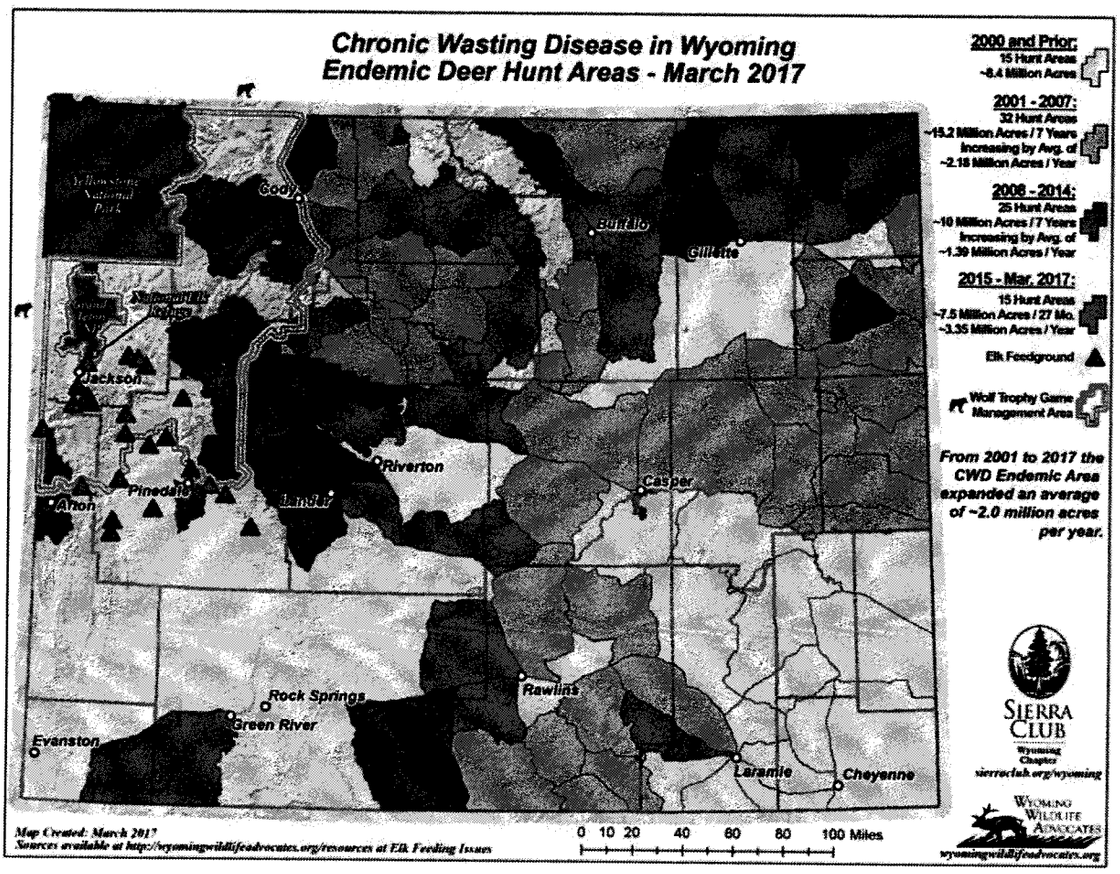
In Montana, for the first time ever, concern about the disease was elevated to high alert. Early in November 2017, a test confirmed Montana's first-ever case of CWD in a wild cervid. The

diagnosis was based on tissue samples taken from a dead mule deer buck harvested near Bridger just north of the Montana-Wyoming state line. Confirmation came ironically on the same day the Montana Fish Wildlife and Parks Department began circulating a draft CWD action plan for public review.

On Nov. 14, 2017, a second dead mule deer buck was confirmed to be CWD-positive. This animal was shot a few miles south of Bridger near Belfry—a tiny town near Red Lodge on the northeastern corner of the Greater Yellowstone Ecosystem.

On November 15, 2017, the Wyoming Game and Fish Department announced that yet another CWD-positive hunt area had been added to its map of CWD-endemic areas that now blanket most of the state. A white-taiedl deer buck had turned up positive near Meeteetse on the eastern tier of Greater Yellowstone. "That hunt area and three others recently added are proof that this disease, in terms of landscape it is reaching, continues to expand millions of acres each year," says Lloyd Dorsey, conservation director for the Wyoming state chapter of the Sierra Club. Dorsey, an elk and deer hunter, added this, referencing a map (see it below) showing the progression of the disease in Wyoming that was prepared by the Sierra Club and Wyoming Wildlife Advocates. "I see no reason to believe that CWD will not advance through Montana as quickly it has through Wyoming."

To see the map, and what it portends, should be a chastening moment for Montana hunters, notes Glenn Hockett of Bozeman, president of the Gallatin Wildlife Association that has joined other groups in Wyoming in suing to have the Wyoming feedgrounds closed.



Foreshadowing the spread across Montana? CWD was first diagnosed in southeastern Wyoming (marked in yellow) and over the last three decades has expanded in deer herds. The disease, in November 2017, was diagnosed for the first time ever in Montana wildlife just north of the state border with Wyoming and is now racing toward the heart of the Greater Yellowstone Ecosystem. Imagine this map flipped sideways to indicate a possible progression northward into Montana. "I see no reason not to believe that CWD will not advance through Montana as quickly it has through Wyoming," says Lloyd Dorsey, hunter and conservation director for the Wyoming state chapter of the Sierra Club.
Lucky the elk was two years old when Thorne and Williams died tragically in an auto wreck in 2004. Along with colleagues, Thorne and Williams were key proponents of the elk experiment at Sybille, intended to provide insights into how animals catch CWD, how it is spread and what prospects, if any, there might be for carriers surviving it.

Before proceeding further here, let us again state an important fact that is still true as of November 2017: there has not been a single documented case of a human coming down with CWD or a prion-related disease after eating a CWD-infected deer or elk.

Several experts I interviewed are not optimistic that will always be the case. Given the ability of prion diseases to manifest themselves in different kinds of strains in different mammals, it is likely that eventually the species barrier, currently keeping CWD a deer-family-only disease, will be breached. The rationale behind their thinking will be explored later.

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So what is the most disturbing aspect of the Wyoming study involving Lucky the elk that CWD experts find so unsettling?

Lucky's wapiti cohort group contracted CWD naturally—simply by being placed in an environment where diseased animals previously had been. Researchers didn't have to do anything to overtly expose the elk to CWD through feed or injection; they merely kept them in pens where CWD had been present and yet its disease-causing prions persisted after sickened animals were removed.

Prions, microscopic misshapen CWD proteins, had entered the soil at Sybille, shed through urine, feces, saliva, possibly in tissue decomposition of dead animals, and likely also became bound to surfaces in Sybille's captive settings. Even modest attempts at decontamination, paralleling what's happened at other sites in other states, did not kill them off. Prions are notoriously difficult to destroy.

Today, this is the question—the big one—looming over the heads of public land managers, wildlife officials, private landowners, public health officials, hunters and the general public dealing with the specter of CWD. It has implications for the northern Rockies and every other corner of North America where CWD has become endemic or will be.

If environmental contamination could happen at Sybille with such devastating results, what could CWD's arrival on the National Elk Refuge in Jackson Hole and Wyoming's 22 feedgrounds mean?

These are landscapes where, every year, roughly 22,000 elk arrive and bunch up in high unnatural densities around artificial human-created forage lines. Elk, in fact, are heading to feedgrounds right now.

At the feedgrounds, wapiti hordes will come in close physical contact with each other; they will urinate and defecate onto the artificial feed and available natural grass they are ingesting; in turn, their wastes will seep into the soil.

Not a single elk or deer has turned up to be CWD positive in these wild feedlot settings yet. However, just as Montana knew that CWD's confirmation in the state was imminent, so, too, do those in charge of the feedground complexes in western Wyoming.

If and when just a single CWD-infected animal arrives, the animal is likely to be asymptomatic as the disease can have long incubation times lasting between months and years in a host. A doomed elk may appear healthy yet its wastes will get deposited into the ground and linger—for how long no one knows.

With more animals getting exposed and then sickened, prion contamination would, ostensibly, bio-accumulate, becoming established in the land, carried potentially in surface water and, as studies have also demonstrated, possibly taken up in living rangeland plants. (Laboratory research has shown that prions can exist in plants, including tomatoes, alfalfa and corn—one of the most universally-used grains in food production.)
Think of this happening winter after winter, year after year: contamination at the Elk Refuge and feedgrounds would start modestly with one animal that creates a tiny toxic hot spot to which hundreds or thousands of other elk and deer would be possibly exposed over time.
Infected CWD animals don't even need to come in direct contact with other elk, deer or moose, because they can shed and leave behind infectious prions in the environment. Stricken ungulates only need to have been there.

Think of this happening winter after winter, year after year: contamination at the Elk Refuge and feedgrounds would start modestly with one animal that creates a tiny toxic hot spot to which hundreds or thousands of other elk and deer would be possibly exposed over time.

If infection sets in at the feedgrounds, CWD would also be transported through living animals to distant summer ranges across lines humans draw on maps, seeding prions shed via feces, urine, saliva and death into other landscapes, creating new environmental zones of infection and exposure.

Some Wyoming Game and Fish officials have claimed that, in the wild, under ordinary lower ungulate densities, CWD exists as a low-grade, slow-moving menace. But the Elk Refuge and feedgrounds are anything but normal, experts say, and for those who have studied CWD, managed ungulates and are worried about the disease's progression, they see the feedgrounds as both a CWD gateway and a disease accelerator. As you read these words, CWD infection is rising rapidly in mule deer in southeastern Wyoming and there is concern herds will be decimated if not rendered extinct.
"We've been courteous to Wyoming and respectful of the argument that states don't interfere with the way other states do business, but when another state does things that affect the quality of life and resources that citizens in Montana value and hold dear, there comes a time when you run out of patience." —Dan Vermillion, chairman of the Montana Fish, Wildlife and Parks Commission
Dan Vermillion, chairman of the Montana Fish, Wildlife and Parks Commission, whose members are appointed by Gov. Steve Bullock, said there is growing indignation toward Wyoming over its operation of feedgrounds. "We've been so focused in this state on brucellosis and trying to do spatial and temporal separation to keep elk and bison away from ag producers. CWD was kind of placed on the backburner of worries. Now we have cases and it's time to confront it head-on," he said.

Brucellosis, Vermillion noted, is not a population-limiting disease; CWD as it settles in can be devastating and the best strategy is to stop any activities that would make it worse.

"To me, the arrival of CWD is terrifying and it's heartbreaking the more I learn about the science and the potential it has to harm our game herds which have contributed to the state's reputation for being the last, best place. Common sense, in the face of a disease event, points to getting rid of the feedgrounds. It's clear that they [feedgrounds] increase the probability of making CWD's impact a lot worse and affecting the progression of disease so that it moves into deer and elk a lot faster."

Vermillion compares CWD to a massive outbreak of exotic weeds originating on one landowner's property and bearing down on adjacent ranches, threatening to overtake their rangeland.

"We've been courteous to Wyoming and respectful of the argument that states don't interfere with the way other states do business, but when another state does things that affect the quality of life and resources that citizens in Montana value and hold dear, there comes a time when you run out of patience," he said.

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Before we progress further, a journalist's acknowledgment is in order. One challenge in writing about CWD is balancing the significant fears being expressed by those involved with tracking the disease against those who claim that because CWD isn't an ecological or human health problem, it never will be.

The topic that wildlife managers are wary about discussing publicly is this: If hunters worry in mass about the potential risks of exposing themselves and their families to disease, they may stop hunting and buying licenses, the fees of which fund their agencies. They also note that hunters are a key tool—human harvest of animals—that adds an option managers have for reducing ungulate herds.

Another area of controversy is the reluctance of state wildlife agencies to acknowledge the important role wildlife predators and scavengers—wolves, grizzlies, cougars and coyotes play —in slowing infectious disease progression by killing weak and sickened prey species. This will be addressed in a coming standalone story.

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As Eric Cole, senior biologist with the Elk Refuge noted in a startling memo circulated in early 2017, CWD's arrival in western Wyoming is imminent. And his warning about its advance was corroborated by the disease's recent diagnosis in mule deer east of Red Lodge, in the Shoshone National Forest between Cody and Yellowstone National Park, and in Wyoming near the towns of Pinedale, Lander, Dubois, and Thayne.

A few years ago, a moose afflicted with CWD was found dead south of Jackson Hole in the southern reaches of Greater Yellowstone, thus giving Wyoming, along with Colorado and Alberta, the dubious distinction of having CWD present in all four of its wild deer family members.

Wyoming, like Montana, has increased the intensity and scope of its surveillance, particularly in areas described as "the western front," meaning the mountains along the Continental Divide and in wildlife corridors leading into Greater Yellowstone.

Like Montana and Idaho, Wyoming and the Elk Refuge tests animals killed by hunters, roadkills, "sick-looking" animals, and they target individuals that represent different age classes in the herds. Wyoming has collected over 56,000 samples, the vast majority from mule deer. Testing, however, is a useful metric not for stating definitely where CWD is, but where it has been. By the time an animal tests positive for disease, CWD very likely, experts say, has been there awhile.

Now with CWD in Montana and two mule deer coming up positive, there is wide speculation about how the state will respond. Will Montana move to "depopulate"—i.e. destroy all animals within a given locale of where the disease is found?

If 38 elk out of 39 at Sybille became stricken and died, how might that rate of infection be extrapolated to wild settings? The elk calves removed from the Elk Refuge and raised at Sybille have a genetic make-up—an MM genotype— that is widespread and the most common in western Wyoming elk herds. Lucky had different genotype—LL—that exists in two percent of a normal population. Some elk also carry a third genotype (ML) that, for some reason, has a resistance characteristic that delays infection but still is 100 percent lethal.

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For even better reading away from the screen, print off this MoJo story and give a copy to your friends.
Montana has its own checkered past involving hypocrisy with the way it confronts wildlife diseases, says the Gallatin Wildlife Association's Glenn Hockett.

Montana's strategy toward confronting another disease, brucellosis, was focused for decades almost exclusively on wandering Yellowstone bison known to be carriers of the Brucella abortus bacteria. However, a panel of scientific experts recently noted that the state has been focusing on the wrong animal. Elk represent the greatest possible threat for wildlife transmitting disease to cattle.

Some argue that CWD should not be discussed as a human health risk because there has never been a documented case of the disease sickening and killing a person. There also has never been a single documented case of a wild Yellowstone bison transmitting brucellosis to a domestic beef cow, yet 10,300 bison, members of the most iconic bison herd in the world, have been felled since 1985—and more will be this winter—based on the mere possibility transmission could happen.

Tens of millions of public tax dollars have been spent targeting and slaughtering wandering park bison based on that premise, but it's a premise that has been scientifically disproved.

Every case in which brucellosis has been transmitted from wildlife to cattle has involved elk, not bison. As the findings of a major fact-finding study, released in 2017 by the National Academies of Sciences revealed, the greatest threat of possible brucellosis transmission from wildlife to cattle comes from infected elk. The National Academy is the most respected scientific body in the world.
Montana has its own checkered involving hypocrisy with the way it confronts wildlife diseases, says the Gallatin Wildlife Association's Glenn Hockett.
The Elk Refuge and the Wyoming feedgrounds, its report noted, are also the largest concentrated reservoirs for brucellosis-infected wildlife in the ecosystem.

Within the ranks of professional wildlife managers, there's no disagreement that feedgrounds have made the amplification of brucellosis in wild elk herds worse. And there is little disagreement that CWD infection is likely to follow the same pattern.

The coup de grace of Eric Cole's frank remarks was this, for it has direct implications for Montana and Idaho, whose elk herds mix with those emanating from Jackson Hole: "Various elk migration studies and research on another disease prevalent on the Elk Refuge—brucellosis—suggest that the current feeding regime and its associated high concentrations of elk could be a source of CWD infection for cervids through[out] the Greater Yellowstone Ecosystem."

Along with the National Academy, the most reputable professional wildlife management organizations in the U.S. say that supplemental feeding of wildlife goes against the best management practices of maintaining health in big game herds.

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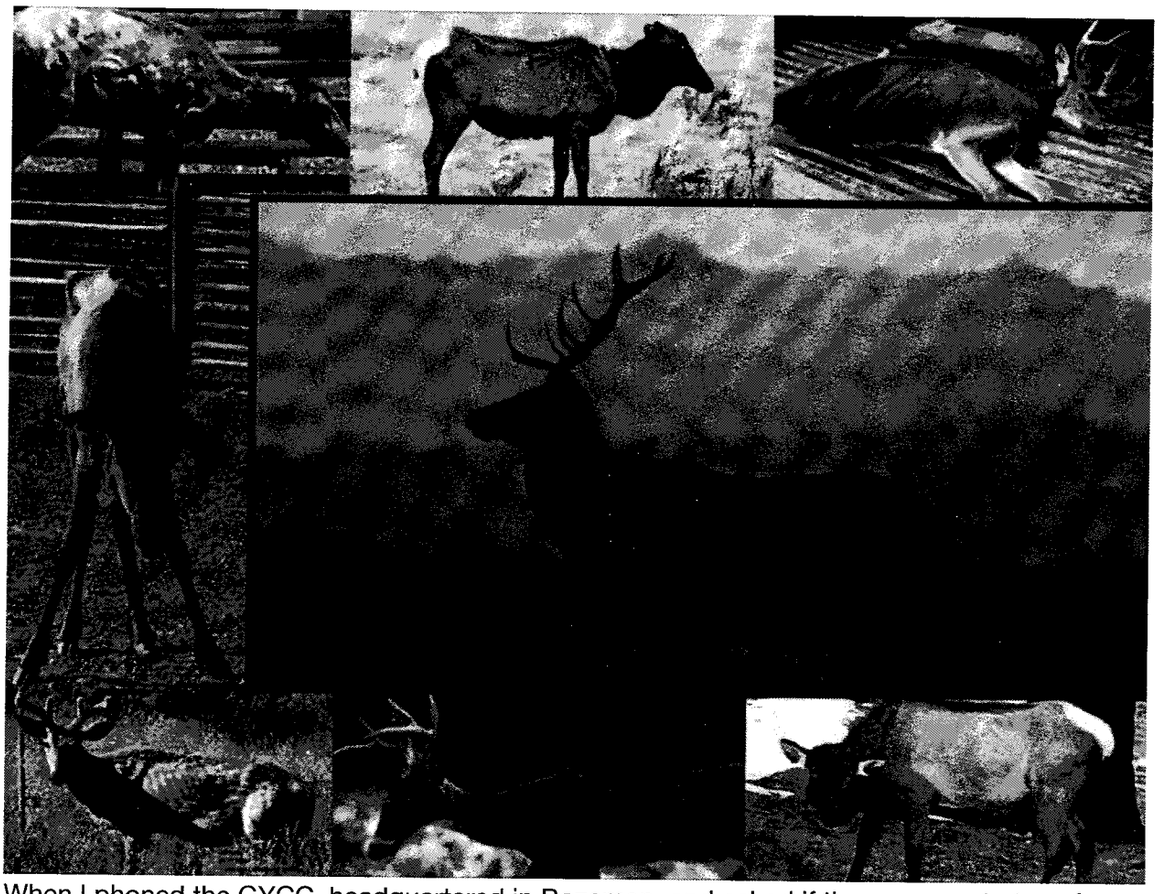
The Greater Yellowstone Coordinating Committee is comprised of senior managers from all of the federal agencies overseeing public lands in the Greater Yellowstone Ecosystem and it interfaces with representatives from the states. The organization is supposed to serve as a nexus, touting itself as being at the forefront of bioregional thinking and planning. Yet critics say its discombobulated approach to addressing wildlife diseases reveals major flaws, causing some to wonder why it even exists.

The GYCC, as of yet, has no coordinated strategy for confronting climate change, or dealing with private-land growth issues threatening the environmental health of public lands, or for assessing the swelling impacts of outdoor recreation on wildlife. In addition, it is doing little to reconcile profound contradictions that exist in management philosophy between government agencies whose public lands exist side by side.

What are its goals for the region? Never has it generated a clear vision. And different agencies on many issues remain entrenched in their own bureaucratic silos. In some cases, agencies are working at direct cross-purposes, meaning one agency uses public tax dollars to stake out a management agenda that undermines the conservation missions of other agencies.



When I phoned the GYCC, headquartered in Bozeman, and asked if there was a strategy for confronting CWD, I was referred to Brian Glaspell, the new chief manager at the National Elk Refuge.

"The general vibe coming from that organization [GYCC] is we both strive to coordinate conservation objectives aimed at the ecosystem scale and support one another in meeting our individual objectives," Glaspell explained.

So is there an integrated plan of attack for addressing CWD, I asked Glaspell. No, there is not, he said.

Leaders of GYCC, even though they are well aware of the potential severe consequences of CWD striking ecosystem ungulate herds, have been reluctant to pressure the Elk Refuge and the state of Wyoming to close the feedgrounds.

Wyoming's state management plan, Glaspell says, doesn't clearly spell out what aggressive actions will be implemented, only vaguely referencing that changes might be warranted when and if CWD arrives. The same criticism is being leveled by conservationists against Montana's recently proposed CWD strategy. Only Idaho, as yet CWD-free, will discuss the third-rail issue in their Action Plan, which is depopulating all cervids in an infected area. If CWD clusters begin to be revealed through post-mortem testing, will states move in to kill all of the elk and deer in given locales?

Back in 1996, Beth Williams, Thorne's wife, responded to reports that CWD was present in a game farm in Saskatchewan. She was asked what she would do if the disease turned up in wild deer. Her recommendation: aggressive, thorough depopulation of deer. "You'll have to be aggressive; remove all sources and all potential movement. Cut wider and deeper than you ever think necessary," she said. "The deer will come back; but you'll get one chance. If CWD gets widely established, you'll have it for a very long time." Blow the opportunity to contain it and there is no turning back.

Such a strategy of "killing the herd in order to save it" is as preposterous to some as feeding elk in order to keep them healthy but actually fostering conditions that could lead to their destruction.

When the National Academy released its report on brucellosis, this was one of its highlighted findings: "Evidence suggests that incremental closure of feedgrounds could reduce the prevalence of the disease in the broader elk population and could benefit overall elk health in the long term. The committee recommended that state and federal land managers take a strategic, stepwise, science-based approach to analyzing and evaluating how the closure of feedgrounds would affect elk health, risk of transmission to cattle, and brucellosis prevalence."

A scientist on the National Academy review team said it also applies to CWD.

The government entity well positioned to help coordinate and encourage that charge may be the GYCC. How disorganized is the GYCC on the monumentally-important issue of CWD? Who is in charge of confronting CWD throughout the Greater Yellowstone region? Answer: no one is.
Consider this: Yellowstone National Park Supt. Dan Wenk and his staff—one member of GYCC — are direly afraid of the consequences the disease will have on wildlife in the most famous nature preserve in the world. However, the future of Yellowstone depends on the attitudes and actions taken by her neighbors.

Another GYCC member, Grand Teton National Park, has the same world-class wildlife values in play and it shares a fenceline with both Yellowstone and the Elk Refuge, yet it has been conspicuously silent about CWD's threat to wildlife.

Meanwhile, another GYCC member, the Elk Refuge, is administered by a sister agency to the Park Service in the Interior Department, the Fish and Wildlife Service. It is carrying out management practices that its own scientists have acknowledged are violating federal law pertaining to wildlife health by keeping the feedgrounds open. Former refuge managers and scientists have, for years, pleaded with their bureaucratic superiors to phase-out feeding, only to be overruled, in large part owed to opposition from Wyoming politicians.

Still another federal agency and GYCC member, the Bridger-Teton National Forest, which reports to the U.S. Department of Agriculture, has been complicit with the state of Wyoming in ignoring the science and keeping the feedgrounds open. As has the Bureau of Land Management, another GYCC member, under the Department of the Interior.

On top of it all, Wyoming, Montana and Idaho each have separate CWD action plans that are vague and theoretical when it comes to dealing with CWD. Who is in charge of confronting CWD throughout the Greater Yellowstone region? Answer: no one is.

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Piecemeal approaches to managing big landscapes like Greater Yellowstone are costly, inefficient and ineffective, especially with wildlife issues. The legacy of management

approaches to logging, mining, and oil and gas development on national forests and BLM lands, and livestock grazing inside Grand Teton Park are evidence of that.

In the defense of Elk Refuge manager Brian Glaspell, who recently arrived at the refuge, he didn't create the problem; he inherited it. The people who have been calling the shots are way, way above his pay grade.

Montana State Senator Mike Phillips says there is a person who could break the logjam of inaction: it's Interior Secretary Ryan Zinke. Zinke, a Montanan, holds ultimate sway over the Park Service, BLM, and pivotally, the Fish and Wildlife Service. He could issue an executive order, and he could request that Agriculture Secretary Sonny Purdue, who has jurisdiction over the Forest Service, mandate change.

"Secretary Zinke could make it clear to the National Elk Refuge that feeding must be stopped and his Interior Department could lead the charge into a new era of enlightened wildlife management." Phillips said. "The Secretary has said he cares about the environment and wants to be a man of action. Here's the perfect obvious place for him to demonstrate it, to do something that's vitally important to the interests of sportsmen and all wildlife-loving Americans."

Phillips, a nationally noted wildlife biologist whose day job is leading the Turner Endangered Species Fund, formerly worked as a canid specialist for both the Fish and Wildlife Service and Park Service. He co-authored a joint resolution in the state legislature that condemned Wyoming for its continuation of artificial feeding. On February 24, 2017 in a rare display of bi-partisanship, the Montana Senate passed the resolution 50-0, calling upon Wyoming to stop its elk feeding programs.

The impacts of CWD will reach into every corner of Greater Yellowstone, across state, county and community lines, affecting quality of life for the region's 450,000 residents who share a common love for wildlife values. It will affect hunters and wildlife watchers, safari company operators, and the experience known to millions of visitors each year.

"With CWD upon us in Montana now, the number one goal should be to end the largest wildlife feeding program on the planet; it's a ticking time bomb and its destructive aspects are well known," said Nick Gevock, conservation director at the Montana Wildlife Federation and former environmental journalist.

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Behind closed doors, local depopulation scenarios have been discussed as options not just to swiftly remove CWD-infected animals but to prevent perpetual CWD contamination zones from being created in the environment.

During the 1990s when Montana voters outlawed private game farms due to zoonotic disease concerns, Idaho too started to worry about CWD; in fact, one aspect of Idaho's CWD action plan lists aggressive deposition within a radius of where CWD turns up.

Montana prohibits the feeding of wild elk. Idaho still permits it during harsh winters and has sent signals it may end the practice. The outlawing of feeding is based on concerns, expressed by both states' Department of Livestock, that feeding wildlife increases the incidence of brucellosis and puts game animals at risk to catching other virulent diseases, including CWD and bovine tuberculosis.

In an article written for The Wildlife Society, retired Elk Refuge biologist Bruce Smith noted that "Colorado tried to reduce CWD in wild mule deer through experimental herd reductions. Wisconsin went a step further: After finding CWD in deer in 2002, the state's Department of Natural Resources sought complete eradication by killing thousands of white-tailed deer with special hunts and culling programs designed to reduce deer densities. Unfortunately, those states' efforts have met with limited success."

In states like Wisconsin, wildlife officials have, at times, resorted to depopulating local white-tail deer herds and incinerating the carcasses to kill prions but the geographic area where CWD is found in Wisconsin continues to expand. Why? Most experts say because of environmental contamination, exacerbated too by the fact that property owners feeding deer still happens prolifically in Wisconsin.
Montana State Senator Mike Phillips says there is a person who could break the logjam of inaction: it's Interior Secretary Ryan Zinke. "Secretary Zinke could make it clear to the National Elk Refuge that feeding must be stopped and his Interior Department could lead the charge into a new era of enlightened wildlife management."
Smith added that "in Illinois, on the other hand, 10 years of government culling of white-tailed deer in areas of new CWD infections has limited disease prevalence to 1 percent. By comparison, prevalence climbed to 5 percent after localized culling in Wisconsin ceased in 2007. A prescription to similarly limit CWD infections of elk crowded on feedgrounds would compel the culling of very large numbers of animals."

Picture this scenario playing out in Jackson Hole along U.S. Highway 191: sharpshooters enlisted to basically destroy a significant percentage of the most iconic elk herd in America, carried out on the National Elk Refuge. Wapiti would have to be mowed down and removed in order to prevent the refuge from turning into a massive contamination zone.

In evidence submitted during a lawsuit brought by EarthJustice attorney Tim Preso against the Fish and Wildlife Service and National Elk Refuge, he introduced a document in which a regional refuge chief for the Fish and Wildlife Service admitted that even reduced feeding operation would, with CWD present, threaten to "create a Super Fund Disease Toxic Site on the [National Elk] refuge that would remain contaminate for a very long time."

When former Elk Refuge Manager Barry Reiswig was asked by superiors in the Fish and Wildlife Service's regional office if he had a plan after the first CWD case was confirmed, he said, "(1) Dig a big hole with a bulldozer or obtain an incinerator. (2) You round up and shoot all suspect [diseased] animals. (3) You cover the hole with dirt or incinerate all killed animals."

Wyoming, in its recent CWD action plan, does not prioritize de-population but what is its strategy for attempted containment? The state already is carrying out two things that contrary to what most experts say is responsible wildlife management: it is running feedgrounds and shooting predators, namely wolves, allowing open season on lobos across 85 percent of the state, for any reason, at any time of day, by any means. The state knows what is coming.

Two years ago, Game and Fish representatives reached out to managers of the Teton County trash transfer station, inquiring about the possibility of operating an incinerator there to process the carcasses of CWD-infected elk and deer. Incineration is the only sure way of destroying prions; however, what good is it to incinerate carcasses if those same animals, over the course of their abbreviated living lives, were shedding prions via urine, feces and saliva across the landscape?

In Danny Schmidt's documentary Feeding the Problem, Jackson Hole rancher Brad Mead, brother of Wyoming Gov. Matt Mead, said, "From what I've heard about Chronic Wasting Disease, it's not a pretty thing to watch. And I have to believe that tourism would suffer, a lot, if

people driving by on the highway past the Elk Refuge saw animals dying from Chronic Wasting Disease in the hundreds or the thousands."

To prevent that scene from materializing, which would be a public relations disaster for a valley that promotes itself to the world as a mecca for wildlife watching, how will agencies respond?

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Steve Kallin, Brian Glaspell's recent predecessor at the Elk Refuge who retired from his post in January 2017, validated an assessment from the Sierra Club's Dorsey in saying the consequences of CWD's arrival could be devastating. It isn't like there will be one epic dying event; herds will winnow over time and giving animals more feed will not mitigate the mortality; in fact, experts say it could intensify the impact of CWD's arrival. And as Dorsey says, the first animal bringing disease to the feedgrounds isn't likely to be an elk but a deer.

"We have to remember this is an always fatal disease for cervids," Kallin told me. "It's slow moving but it's a serious disease. We have to look at it honestly and pragmatically and address it head on. This is not a manufactured scare tactic to promote a political agenda."
The impacts of CWD will reach into every corner of Greater Yellowstone, across state, county and community lines, affecting quality of life for the region's 450,000 residents who share a common love for wildlife values. It will affect hunters and wildlife watchers, safari company operators, and the experience known to millions of visitors each year.
Wyoming wildlife filmmaker Shane Moore, whose Emmy-award-winning cinematic work is known around the world, and who has made tracking the science of CWD a personal passion, says the general public isn't aware of how "game-changing" CWD's arrival in Greater Yellowstone could be.

The impacts will register in wildlife and for people, from tourists to hunters, who travel from far away to experience the ecosystem's charismatic deer-family species and the things that eat them.

Moore and Dorsey have been outspoken in their reproach of the Wyoming Game and Fish Department. Their concerns are shared by Reiswig, Smith and Dr. Thomas Roffe, former national chief of wildlife health for the Fish and Wildlife Service. In Yellowstone, managers have no plans for how they will deal with haggard-looking elk and mule deer in the spring that might be thin from enduring a winter in Yellowstone or potentially stricken with CWD.

Will they shoot the animal? Will they test all winterkilled animals? Will they remove carcasses on the ground that serve as valuable food sources for predators and scavengers? Will they start marking the place where CWD-positive elk have fallen and test the soil for prions? If CWD strikes the Lamar Valley and the northern range, which has been compared to a mini-American version of the Serengeti, how will it disrupt the food chain? Park officials don't know what they'll do.

At a wildlife disease symposium on brucellosis hosted by the National Academies of Science in the summer of 2015, P.J. White, Yellowstone's chief of wildlife and aquatic resources, made reference to CWD: "Brucellosis isn't the only disease issue in town. We have CWD about 40 miles from [Yellowstone] in mule deer. Which means it's probably already in the park, we haven't detected it yet."

Just a few months later, a mule deer infected with CWD was shot by a hunter about a dozen linear miles from Yellowstone's eastern border. A mule deer can easily cover that distance between in a couple of hours. Another CWD mule deer was identified in Star Valley, Wyoming

near the Idaho state line. CWD is bearing down on the heart of Greater Yellowstone from three directions.

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Dr. Don Davis, a former researcher in veterinary medicine at Texas A & M and a defender of captive game farming of wildlife, believes fears surrounding CWD are overblown. He sent out a number of op-ed pieces to newspapers this fall. Among the points Davis emphasizes are these: "First, CWD does not affect people. It affects deer, elk, and moose, but there are no documented cases in people. This isn't unusual; there are lots of things that affect cats, dogs, horses, and wildlife that don't affect us, and vice versa," he writes. "Second, CWD has been around for decades. It was first detected in the wild 30 years ago in Colorado. Not only is the deer population still strong in the Centennial State, but so is the hunting culture."

Actually, the reality of the portrait Davis paints is not nearly as sanguine in Colorado for deer and elk. For years, Davis worked on various advisory panels making recommendations for how wandering Yellowstone bison should be managed in Montana. Ironically, some of those panels helped elevate an atmosphere of fear, exploited by Montana's Department of Livestock and the U.S. Agriculture Department's Animal and Plant Health Inspection Service, that resulted in the slaughter of thousands of park bison.

Where Dr. Davis downplays the risk of CWD, citing lack of evidence, others say that waiting for an outbreak of CWD to strike wildlife or the disease to reach people is naıve and irresponsible.

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In early 2017, Dr. Valerius Geist, David Clausen, former chair of the Wisconsin Natural Resources Board, Vince Crichton, former co-chair of Canada's National Wildlife Disease Strategy, and Darrel Rowledge, director of Alliance for Public Wildlife, published a white paper titled "The Challenge of CWD: Insidious and Dire". You can read the full report here and read their executive summary, published at Mountain Journal, by clicking here.

"Left unchecked, the prospects for wildlife are bleak. CWD has clear population impacts; some models suggest extinction. Disproportionate impact on mature males carries implications for hunters and wildlife economies let alone populations. Still more bad news: Efforts for vaccines have failed, and evolutionary or adaptive salvation is unlikely and would be too late in any case," they write. "CWD is now deemed to be the largest-ever mass of infectious prions in global history, and experts sum up the threat (to wildlife, agriculture, our economies, and potentially to human health) in two words: 'insidious and dire.'"

They estimate that hunting families in North America are presently consuming between 7,000 and 15,000 CWD-infected animals annually. The number is growing exponentially. Many are probably unaware their harvested animals are CWD carriers.

If readers aren't concerned about CWD yet, they will be after digesting what's in the report—a distillation of both comments from experts and articles published in the scientific literature. One cause for concern, off the radar screen of ranchers and even food consumers, is the ability of prions to bind with plants, such as alfalfa (hay). Therefore, it means not only could exposure increase via plant material being consumed by livestock (which people eat) but also products that show up in restaurants and the grocery store. And what about the widespread practice of moving hay around the landscape? Would hay produced in a CWD area need to be tested?

The report features excerpts from Dr. Christopher Johnson, a scientist with the US. Geological Survey: "Vegetation is ubiquitous in CWD-contaminated environments and plants are known to absorb a variety of substances from soil, ranging from nutrients to contaminants. The uptake of proteins from soil into plants has been documented for many years and we have been investigating the uptake of prions into plants in vitro. Using laser scanning confocal microscopy, we observed root uptake of fluorescently-tagged, abnormal prion protein in the model plant Arabidopsis thaliana, as well as the crop plants alfalfa (Medicago sativa), barley (Hordeum vulgare) and tomato (Solanum lycopersicum)."

Studies showed that prion uptake occurred in roots and was transferred to stems and leaves of those plants as well as corn. "Both stems and leaves of A. thaliana grown in culture media containing prions are infectious when injected into mice, and oral bioassays are underway for A. thaliana and other plants," Johnson wrote. "Our results suggest that prions are taken up by plants and that contaminated plants may represent a previously unrecognized risk of human, domestic species and wildlife exposure to CWD and scrapie agents."

How will farmers and ranchers respond to elk and deer in their pastures if they suspect the wild animals could be infecting the soil where their livestock eats grass and alfalfa and other crops grow? What kind of a backlash could there be against public wildlife?

Having examined what the authors describe as a sloppy and lackaidaisical approach to containing CWD, they call for urgency by government agencies in applying the precautionary principle. Both public wildlife and human health are at risk, they say. (Note to readers: the Alberta Environment and Parks Department has one of the best databases for tracking the progression of CWD in wild ungulate herds).
How will farmers and ranchers respond to elk and deer in their pastures if they suspect the wild animals could be infecting the soil where their livestock eats grass, and alfalfa and other crops grow?
"Where there is a potential for severe or irreversible harm, especially to public wellbeing and interest, an absence of scientific consensus or proof of harm cannot be used to allow or maintain policies or actions underlying the risk. In such cases, the burden to 'prove safety' falls on those advocating the potentially harmful policy or action," they write, referring to both game farms and feeding of wildlife.

"The standard of 'severe or irreversible harm' is a very high bar; yet [a bar] CWD has long surpassed regarding public wildlife. It is only against that backdrop that the potential transference of CWD to people can be reasonably considered. We must consider risk, consequences, and even worst case scenarios. The fact is that prion diseases are described by physicians and victim's families as aggressive, horrific, and dreadful."

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Conspicuously missing in action on the feedground issue is, ironically, the largest elk conservation group in the world, the Rocky Mountain Elk Foundation headquartered in Missoula.

A few years ago, I attended a symposium on brucellosis in Billings, Montana sponsored by the Elk Foundation. The Fish and Wildlife Service's top national wildlife veterinarian Tom Roffe was there, so were senior natural resource managers from the Forest Service, Park Service, BLM and the tri-states, including Scott Talbott, today director of Wyoming Game and Fish. CWD was a red-button issue.

The overwhelming consensus from scientists at the meeting was that artificial feeding had to stop in Wyoming, a position that for Talbott was considered politically untenable. David Allen, the Rocky Mountain Elk Foundation's president and CEO, refused to back shuttering the feedgrounds because of pushback from outfitters and guides in Wyoming, even though scientists who condemn the practice. It was recently announced that Allen will be leaving the Elk Foundation in 2018.

Despite the Elk Foundation refusing to challenge Wyoming into staking out the true elk conservation position—closing the feedgrounds—the hunting community is concerned. A coalition called The CWD Alliance was created by the Boone and Crockett Club, Mule Deer Foundation and Elk Foundation in 2002, a decade and a half ago.

An advisory circulated by the Alliance says this, "Implications for free-ranging populations of deer and elk may be even more significant. Agencies do not translocate deer and elk from CWD endemic areas. Ongoing surveillance programs are expensive and draw resources from other wildlife management needs. Perhaps most important, impacts of CWD on population dynamics of deer and elk are presently unknown. Modeling suggests that CWD could substantially harm infected cervid populations by lowering adult survival rates and destabilizing long-term population dynamics."

The advisory added, "Ultimately, public and agency concerns and perceptions about human health risks associated with all TSEs may erode participation in sport hunting in the endemic area, and also may have dramatic influence on management of free-ranging cervid herds where CWD is endemic. It follows that responsible wildlife management and animal health agencies should continue working to understand and limit distribution and occurrence of CWD in free-ranging and farmed cervids."

Former Elk Refuge biologist Bruce Smith brings attention to another issue, that U.S. taxpayers through the feeding program are unknowingly subsidizing elk outfitters and guides. "Feedgrounds boost elk numbers but at extraordinarily high costs," he wrote in his article for The Wildlife Society.

"Just wait, when CWD takes hold in those herds, that's when the blame game is going to be begin. That's when you see people who were in charge start to dive for cover, but it will be too late." —the late Jack Ward Thomas, former chief of U.S. Forest Service, elk biologist and adviser to the Rocky Mountain Elk Foundation

"The state of Wyoming, for example, spends more than $2 million annually to feed elk and to study and manage feedground disease. This typically produces an annual deficit above revenues derived from the sale of licenses to hunt elk west of the Continental Divide, where the state's feedgrounds are located," he said. "The total runs far higher because U.S. taxpayers foot the bill for most management costs at the National Elk Refuge. As a wildlife professional, I find the ecological costs of this agricultural model of managing public resources most disturbing."

Dr. Tom Roffe, the former national chief of wildlife health for America's most prominent public wildlife agency, is not the kind of person who derives satisfaction from having his fears proved right. Not long after that meeting in Billings, after years of pressuring the Fish and Wildlife Service to stop feeding on the Elk Refuge, he retired to a little horse ranch in Montana. He told me he wasn't bitter about having his warnings fall upon deaf ears, but that once upon a time in his career he had believed that speaking the truth would prevail.

Over the years I've spoken with a number of prominent sportsmen, including people closely associated with the Elk Foundation such as the late elk biologist Jack Ward Thomas, who was also a onetime chief of the Forest Service. Thomas attended the meeting in Billings mentioned above along with Roffe.

In his own off-color way, Thomas told me that Wyoming's pushback "was the epitome of short-sightedness" and he predicted: "Just wait, when CWD takes hold in those herds, that's when the blame game is going to be begin. That's when you see people who were in charge start to dive for cover, but it will be too late."

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When Rowledge and I spoke recently he had just harvested a game animal in the Canadian Rockies. He and Geist spent a lot of time during the 1990s talking with Thorne, Williams and Robert Lanka. Lanka today is statewide wildlife and habitat management supervisor for the Wyoming Game and Fish Department.

Rowledge says Lanka played a seminal role in amassing a report on the threat that zoonotic diseases, which become rife in game farms, pose to wildlife populations. And it was on the strength of that report that the Wyoming Game and Fish Department voted to deny Tom Dorrance's permit to open a game ranch in Wyoming where hunters could shoot exotic species and animals could be sold for their wildlife parts. The data was used too by wildlife officials in Montana to make the case for closing down game farms.

Thorne could become cantankerous and short in dealing with conservationists and people like Smith and Roffe who were saying Wyoming needed to shutter its feedgrounds. And he argued that CWD would not seriously impact deer and elk at the population level.

In July 2002, Williams, Thorne, Dr. Terry Kreeger and two others published a peer-reviewed paper titled Chronic Wasting Disease of Deer and Elk: A Review With Recommendations for Management in The Journal of Wildlife Management. One of the co-authors was Dr. Mike Miller, a senior wildlife veterinarian with the Colorado Division of Wildlife and a noted CWD authority mentioned in the first part of this series.

"CWD could have a dramatic influence on management of free-ranging cervid herds where it is present. It follows that responsible wildlife management and animal health agencies must act to limit distribution and occurrence of CWD in free-ranging and farmed cervids, and should continue working to better understand the biology and potential methods for control of CWD," they wrote.

Later, Kreeger, who succeed Thorne after he died in 2004, was lead author on another paper in which the authors observed, "Chronic wasting disease will probably be one of the significant wildlife management challenges in the 21st century. The disease not only has serious wildlife ramifications, but economic, political, and social impacts as well. Although the 'need' to blame someone for a problem seems to be inherent in humans, accusations and finger pointing do little to effect a solution. Nobody intentionally caused or spread CWD. But now that it is spreading throughout North America, we must all work together to minimize its impact on our natural resources."

For Dorsey of the Sierra Club, he is baffled. Williams, Thorne and Kreeger spelled out the problems. They knew that elk feedgrounds were, and are, problematic where disease is concerned. Yet time and again they resisted any push to abolish feedgrounds. As for blame, Dorsey asks who—what individual or individuals—will take responsibility for knowing what the right thing to do was, yet deliberately did the opposite? Should responsibility, accountability and potential liability fall with state wildlife vets, with public land managers, or governors?

"Tom Thorne died before the most recent data emerged, showing that CWD in fact is a serious threat to elk to Rocky Mountain National Park, and that is hitting mule deer in southeastern

Wyoming," Rowledge said. "He was a thinker who would adapt this opinion to new scientific information as it emerged."

A study in Rocky Mountain National Park showed that CWD has a prevalence rate of 12.9 percent in elk there and concluded CWD-caused mortality can exceed natural rates of mortality, reduce survival of adult females, and decrease population growth of elk herds. The infection rate there was one percent in park elk in the early 1990s and today is the leading cause of death among adult females.

So desperate is the conversation about how to contain CWD-related environmental contamination that experiments are being undertaken by which controlled burns are being lit to try to kill prions in soils and vegetation.

I asked Rowledge, a hunter, about how he responds to state wildlife officials who say one must not sound an alarm about CWD because it could cause sportsmen and women to stop hunting?

In the 1990s, Rowledge was labeled a CWD fear monger. "Back then, we heeded the claims from people who said don't speak out too loud because it might cause hunters to stop hunting," he said, pointing to Wisconsin. There, in early 2002, CWD was discovered in three white-tailed deer. Nine months later, the number of hunting licenses fell by 90,000, resulting in a revenue drop of $3 million and loss of economic impact of $50 million attributed to hunters not going afield and making equipment expenditures with local business. He cited responses from a study that examined hunter attitudes. Some 64 percent said they would quit hunting altogether if there's ever a confirmed case of CWD being transmitted from cervids to humans. "I think we made mistakes and one of the mistakes is we weren't vocal enough. We were too cautious. If we want to maintain hunting, we need to maintain healthy wildlife populations and that means responsible, science-driven wildlife management. We need to understand what these diseases mean, not only for wildlife but human health." —Darrel Rowledge, hunter and CWD policy expert from Alberta
What he next said is surprising. "I think we made mistakes and one of the mistakes is we weren't vocal enough. We were too cautious. If we want to maintain hunting, we need to maintain healthy wildlife populations and that means responsible, science-driven wildlife management. We need to understand what these diseases mean, not only for wildlife but human health. But one thing we are not talking about with prion diseases is how they affect public perception and how that affects markets. When and if CWD reaches that level, the problems we are dealing with now will be an order of magnitude greater. We need to stop living in denial."

He and his co-authors in "The Challenge of CWD: Insidious and Dire" write: "Trustees accept and bear a burden of responsibility to protect and defend the interests of their constituents, and those of future generations. Where so-called hard sciences probe the vital questions of 'what is' and 'what was,' governance, or political science, must build from that foundation to confront the equally challenging questions of 'what if.' "

Dorsey asks: If science isn't driving decisions being made about CWD and wildlife in Wyoming and Greater Yellowstone, then what and who is? He believes the public deserves to know the names of the actual people who are overriding the science. Rowledge adds that people knowingly violating the public trust and the precautionary principle ought to be held to account and those at the top of the list are elected officials such as governors and the heads of state wildlife management agencies.

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During the past few years, some Wyoming Game and Fish officials expressed optimism that hope for dealing with CWD might reside not in shutting down the feedgrounds but in development of a vaccine. This year, the results of that effort were reported and they are bleak. Not only did the vaccine not prove to protect cervids from catching CWD but innoculations caused some cervids to actually get sick and die.

Which leads us back to Lucky. In that study involving her at Sybille, the wild elk calves taken from the Elk Refuge were shown to have three different genetic makeups. Most had MM genotypes and are representative of about 70 percent of wild wapiti in the Elk Refuge herd. All of those died relatively quickly from CWD when exposed to environmental contamination.

Then there were elk with ML genotypes, representing about 28 percent of the herd. They survived longer before getting infected and succombing but they all died, too.

And then there was Lucky, a rarity with an LL genotype. Just two percent of elk have a genetic code like her.

Kreeger tried to put a positive spin on the results when he still worked for the agency. His is a belief in "evolutionary adaptation", i.e. the premise that CWD infected mothers will produce offspring before they die and CWD-resistant elk will be giving birth to seed-stock to rebuild populations if they crash.

Lucky and some of the other elk cows produced offspring and Kreeger speculated it was possible that reproduction could outpace death caused by CWD. However, the model showed that over a century, hunting would need to be curtailed if not eliminated and that elk with genomes MM and ML would likely vanish.

To put that in perspective, what if in a human community, 3800 out of 3900 people died due to a pandemic like the Black Plague and the restoration of civilization would rest on the surviving 100?

Would that be a cause for optimism or existential gravity? For Rowledge, it's the latter. As he and his fellow authors note, healthy wildlife populations are more resilient when they have more genetic diversity. CWD actually destroys and reduces diversity, leaving surviving gene pools potentially more vulnerable to other maladies and possibly less capable to deal with environmental factors. He says it's an incredibly risky proposition to bet on one genotype; moreover, it completely evades the reality that CWD would mean the loss of elk and deer abundance, as we know it today, by the end of this century.

In fact, some of Kreeger's associates have in recent years been mentioning the dreaded "e-word"—extinction—in recent discussions of what the future may hold for today's dominant elk herds in Greater Yellowstone. That will be explored in an upcoming part of this series.

Can and should the persistence of some of America's greatest elk herds, in America's most iconic ecosystem, be pinned on the survival of Lucky? How did Lucky's story end?

Within the last few weeks, I was in touch with Brant Schumaker, who was involved with the decade-long study of Lucky and with Dr. Mary Wood, Wyoming's state wildlife veterinarian and the successor to Kreeger and Thorne. I asked them about Lucky: was she still alive or dead? Did she outrace the plague as an animal with hyper-rare, hopeful immunity and what is the status of her offspring? They were coy and wouldn't tell me. They only said that she is part of a new study. I asked for an updated photograph of Lucky to use in this story. Lucky is, after all, a named animal and arguably a celebrity. My request went unanswered.

I am still waiting to hang a picture of Lucky on the wall.

Part 4

DECEMBER 11, 2017

The Undeniable Value of Wolves, Bears, Lions And Coyotes In Battling Disease
WILL THE FAIRY TALE MENTALITY OF WESTERN STATES AGAINST PREDATORS HAMPER THEIR ABILITY TO SLOW CHRONIC WASTING DISEASE?
by Todd Wilkinson

Photo courtesy NPS / Jacob W. Frank
PART FOUR

For over two decades, Douglas Smith and successive teams of researchers have watched wildlife predators hunting for prey in Yellowstone.

The national park's senior wolf biologist says there is no mistaking the way that lobos identify and target elk. To the human eye, an individual wapiti might appear perfectly healthy yet there is something—almost a sixth sense— that catches the attention of discriminating pack members searching for their next meal.

It might be an elk with arthritis carrying a slight gimp in its gait, or maybe a hint of winter-worn fatigue, a slowness brought on by advancing old age or illness, or perhaps naıve behavior exhibited by the young.

There is no doubt, based on the accrued record of wolf behavior documented in Yellowstone—and the significant body of scientific accounts logged across the continent—that under normal conditions, wolves key-in on prey that is meek, infirmed or vulnerable.

"Wolves pick up on stuff we can't see. They are most efficient at exploiting weaknesses in prey because their survival depends on it," Smith told me recently. "They are predisposed, by instinct and learned behavior, to focus first on animals that are easier to kill rather than those living at the height of their physical strength."

Does having predators on the landscape—wolves, bears, mountain lions and coyotes—provide a protective gauntlet that can help slow the spread and prevalence of deadly diseases?

In particular, with ultra-lethal Chronic Wasting Disease now invading the most wildlife-rich ecosystem in America's Lower 48 states and spreading coast to coast, are these often maligned meat-eaters, frequently dismissed as worthless vermin in western states, actually important natural allies in battling CWD?

"Wolves pick up on stuff we can't see. They are most efficient at exploiting weaknesses in prey because their survival depends on it. They are predisposed, by instinct and learned behavior, to focus first on animals that are easier to kill rather than those living at the height of their physical strength." —Yellowstone's chief wolf biologist Douglas Smith

While the data and the assessments of most scientists clearly suggests yes, there remains fierce resistance by some to acknowledge the beneficial roles predators play. At the recent year-end meeting of the Montana Fish and Game Commission, anti-predator biases were on full display, especially toward wolves. They surfaced as the commission pondered its next move in confronting CWD which this autumn entered Montana via sick wild deer for the first time in state history.

Weeks earlier, Ken McDonald, wildlife bureau chief at the Montana Fish Wildlife and Parks Department, raised eyebrows when he claimed the advantages predators bring in weeding out sick prey is merely theoretical and unproved. Dismissing the notion of wolves as effective disease-fighters, he asserted that in order for lobos to truly make a difference in slowing CWD's advance, they would need to exist in such high numbers that it would be socially unacceptable to humans, namely ranchers and hunters.

In terms of Montana's strategy for dealing with CWD spread in the state through sick wildlife entering via Wyoming from the south and Canada to the north, McDonald said the state's primary method of confronting disease will involve enlisting hunters to aggressively harvest animals in emerging CWD endemic zones. The state recently approved the issuance of 1,200 additional B tags to kill deer in areas east of Red Lodge, Montana (the northeast corner of Greater Yellowstone) where six dead deer have turned up CWD positive out of 1300 tested there—four mule deer bucks, a mule deer doe and a white-tailed doe.

Many claim McDonald's characterization of wolves demonstrates not only a personal anti-wolf bias, which also permeates the thinking of the department, but it shows a lack of understanding and appreciation for the natural history of the species. In other words, it denies what the very essence of a wolf is.

"I was disappointed with Ken McDonald's nonsensical bureaucratic response," conservationist and professional biologist Dr. Gary J. Wolfe wrote recently in comments that were widely circulated.

Wolfe is a former Montana Fish Wildlife and Parks Commissioner appointed by Gov. Steve Bullock. Notably, he is also the former project leader of the CWD Alliance founded by a number of prominent sportsmen's' groups and former national president and CEO of the Rocky Mountain Elk Foundation for 15 years. He is widely respected in hunting circles.

"While I don't think any of us large carnivore proponents are saying that wolf predation will prevent CWD, or totally eliminate it from infected herds, it is ecologically irresponsible to not consider the very real possibility that wolves can slow the spread of CWD and reduce its prevalence in infected herds," Wolfe says. "We should consider wolves to be 'CWD border guards,' adjust wolf hunting seasons accordingly, and let wolves do their job of helping to cull infirm animals from the herds."

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wolf hunting seasons accordingly, and let wolves do their job of helping to cull infirm animals from the herds." —biologist Gary Wolfe, former Montana wildlife commissioner and former CEO/president of the Rocky Mountain Elk Foundation
Strong evidence seems to bear him out. Not only do predators stalking large game species target weak animals, they can mitigate the impact of disease outbreaks, experts say. Further, by removing sick prey species, predators could, over time, though this is unproved, make herds more resilient and stronger, less susceptible to disease.

While some may doubt this premise, illustrated in literature below, no one has provided evidence suggesting that having robust and stable numbers of predators will not aid in confronting the most rapidly spreading and fearsome new disease in North America.

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The Greater Yellowstone Ecosystem is a region unparalleled in the Lower 48 states. It is known globally as America's Serengeti for having its full original complement of mammal and bird species, including large native predators, that were here when Europeans arrived on the continent in the late 15th century. Plus, the landscape these animals inhabit, a 22.5-million-acre mixture of private and mostly public land, is intact—meaning not fragmented and enabling migrations of elk, deer and pronghorn (antelope) to occur and which do not exist anywhere else.

Lloyd Dorsey, conservation director for the Sierra Club in Wyoming, is a hunter and crusader against Wyoming's operation of elk feedgrounds. This autumn when we spoke about predators and CWD, he had just returned from hunting in the Gros Ventre mountains east of the National Elk Refuge. He told me of how on the morning that he glassed mule deer and bands of elk, he found grizzly tracks in the snow and heard wolves howling a quarter mile away.

Citing reams of scientific studies to back him up, Dorsey says predators play an import ecological role in keeping prey species in check and in serving as vanguards in removing sick animals. Greater Yellowstone's "predator guild" of wolves, grizzly and black bears, lions and coyotes, he notes, also makes it a draw for wildlife watchers from around the world, helping to fuel a $1-billion annual nature-tourism economy tied to the national parks alone.

A disease like CWD that stands to significantly harm the health of deer family members over time—deer, elk, and moose—also has potentially grave implications for species that eat and scavenge their remains. In many ways, the biological integrity of Greater Yellowstone's large mammal populations depends upon the health of its ungulate herds and the biomass they provide in sustaining other species large and small—those with fur and feathers down to the microbial level. Diseases that threaten to dramatically diminish Greater Yellowstone's ungulates could have negative, far-reaching consequences for people and the environment.

To date, there is no evidence that CWD can infect predators, humans or livestock, though geneticists who have studied the molecular make-up of CWD prions [misshapen proteins] believe it could change. And a recent study in Canada involving macaques exposed to CWD prions has elevated concerns. Macaques are primates with genes similar to humans.

With CWD, Wyoming is perilously burning the candle at both ends and it has implications for Montana and Idaho, Dorsey says. Wyoming and the U.S. Fish and Wildlife Service continue to knowingly operate feedgrounds [read parts One, Two and Three of MoJo's series here] which makes the state and federal government guilty of game management malpractice by setting up public wildlife for calamity, he says.

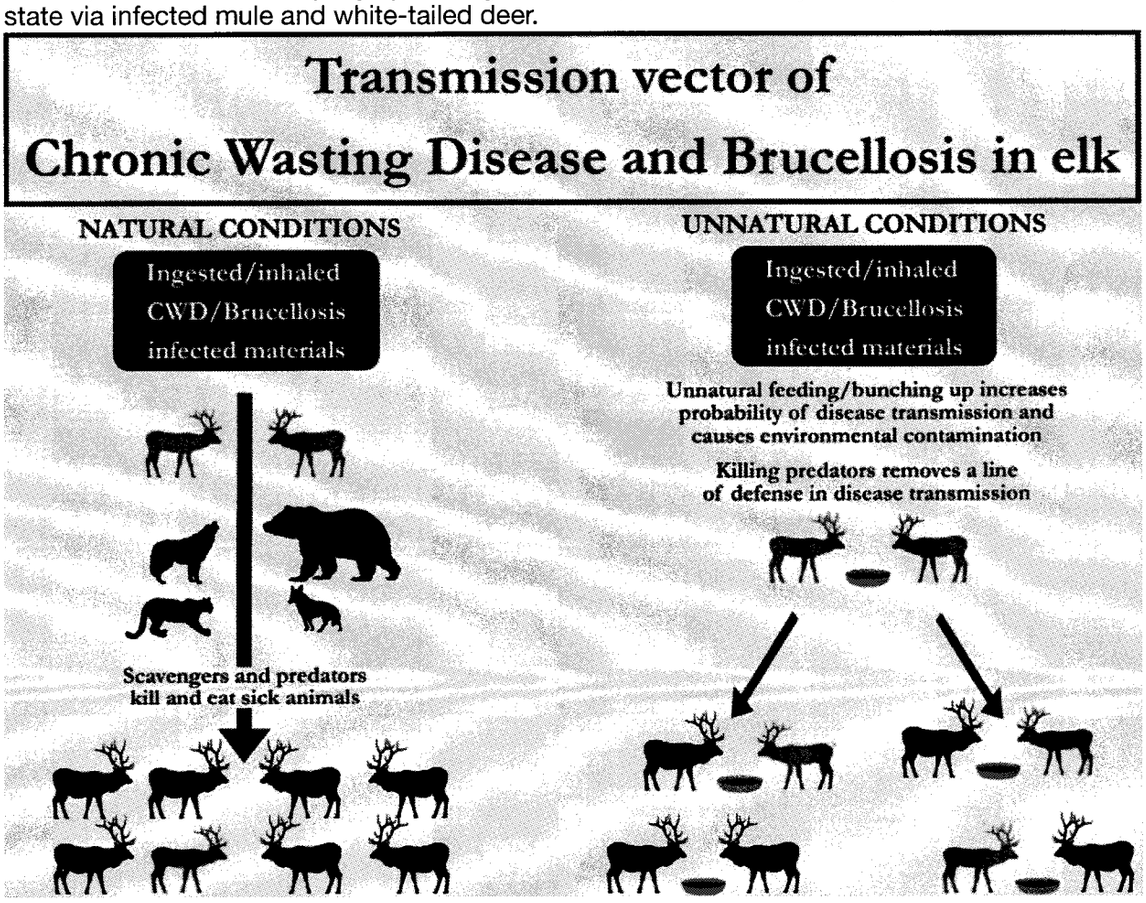
At the same time, Wyoming persists in destroying a natural ally—wolves—based upon no solid reason other than traditional cultural animosity toward these archetypal animals that earlier generations of settlers took great delight in eradicating to make way for livestock.

"Our understanding of wolves has broadened in an age of greater scientific and ecological awareness," Dorsey told me. "They are not the animals of menacing myth they were portrayed to be in fairy tales. We can—and should—co-exist with them for mutual benefit."

Nonetheless, Wyoming—along with Alaska—is known for having the most notoriously-hostile attitude toward wolves in America. There, in over 85 percent of the state, lobos, like coyotes, can be killed year-round for any reason, no questions asked. Only in the northwest corner of Wyoming within the vicinity of Yellowstone and Grand Teton national parks are wolves classified as a game animal and even there it is state policy to keep their numbers suppressed to please outfitters, guides and ranchers.

Beyond that small zone, they are classified as "predators" and treated as vermin. They can be trapped, poisoned, shot at any and all hours of the day, and targeted by aerial gunners in aircraft. Even if they are not threatening livestock, it's open season on wolves.

The profound irony is that just as Wyoming condones a campaign of re-eradication against wolves, CWD has been rapidly spreading westward, faster than anyone expected across the state via infected mule and white-tailed deer.



Perfect conditions to amplify a CWD pandemic, experts say, exist on the National Elk Refuge and 22 elk feedgrounds operated by the state of Wyoming, many of them on U.S. Forest Service land.

CWD's arrival is considered imminent. When the disease lands in the Wyoming feedgrounds, where more than 20,000 elk are unnaturally concentrated during winters, CWD is expected to not only take hold but have its spread accelerated due to the widely-condemned management practice of bunching up wapiti. The conditions there are similar to game farms where CWD infections have been devastating.

This point was made in a letter sent December 7, 2017 from the Montana state wildlife commission (read it at bottom of this story] to counterparts in Wyoming, asking the state to take steps to shut down feeding.

"We respect the fact that how Wyoming manages its affairs is up to Wyoming. However, Montana's ability to combat CWD will depend upon decisions that Wyoming makes about its wildlife management. Over the long-term, the feed grounds make your wildlife populations less healthy, less stable, and much more vulnerable to a catastrophic disease event," the Montana Fish and Wildlife Commission wrote. "We implore you to begin the process of looking at alternatives to the present management regime that unnaturally concentrates wildlife in feed grounds each winter and increases the pace at which CWD infects both states' wildlife populations."

The letter ends with this warning: "If we do not address CWD, we will all be culpable in leaving a greatly devalued landscape to future generations." Culpable is a word with many connotations.

While Montana has escaped the intense scrutiny and public rebuke aimed at Wyoming over its operation of feedgrounds and controversial management of wolves, Wolfe and others say Montana isn't much better with regard to predators.

Recently, another case of CWD was confirmed in a deer near Chester along Montana's Hi-Line south of Canada.

Currently, only three wolf management units in Montana have strict quotas (two located north of Yellowstone and one west of Glacier National Park). But all others allow unlimited wolf harvest "which is probably not the best ecological strategy for containing CWD," Wolfe noted. "As a wildlife biologist who spent several years working on the CWD issue, I believe wolf predation is an important tool that needs to be recognized and effectively utilized, along with other tools, as part of Montana's CWD management plan."

Wolves, Wolfe says, ought to have their numbers safeguarded in areas that represent the front line of disease. Stable packs can serve as a barrier. Wolf management units (WMUs) that border CWD infected areas (or have CWD infected herds within the WMU) should have conservative wolf harvest quotas, he notes. Currently, only three WMUs have quotas (313 and 316 immediately north of Yellowstone, and 110 west of Glacier). All others allow unlimited wolf harvest.

When the argument has been presented to the Wyoming Game and Fish Department, it has been met with deaf ears, though Dr. Mary Wood, the state wildlife veterinarian noted in 2016 that predators can play a beneficial role.

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Humans can invent any fairy-tale-reason they want to despise wolves and justify their elimination, but that doesn't change the fundamental time-tested nature of the species, says Kevin Van Tighem, a hunter and former superintendent of Banff National Park in Alberta's Canadian Rockies. "I don't know of a single credible biologist who would argue that wolves, along with other predators and scavengers, aren't important tools in devising sound strategies for dealing with CWD." Van Tighem says it can be rationally argued that wolves provide the best line of defense since they are confronting infected animals.

Van Tighem told me, just as a dozen other scientists and land managers who hunt have—that once CWD is confirmed in the places where they go afield, they will no longer eat game meat from that area and may stop hunting altogether.

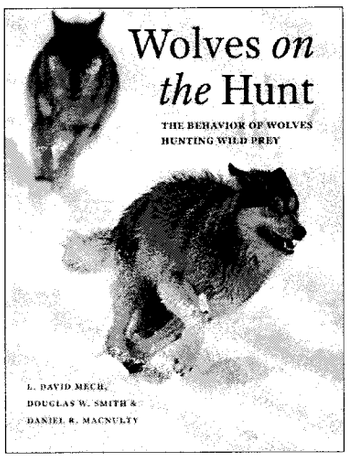
Dr. L. David Mech, the eminent American wolf biologist, has authored or contributed to hundreds of peer-reviewed scientific papers on wolves and prey. We've been talking about wolves since the late 1980s when he came to Yellowstone in the years before lobos were reintroduced. There's no tangible argument he's seen that suggests wolves wouldn't be useful in combatting CWD.

"In the main, the preponderance of scientific evidence supports the view that wolves generally kill the old, the young, the sick and the weak," Mech said. "There's so much documented field data behind it."

He then made a point that exposes the limitations of relying on human hunters and sharpshooters alone to remove suspected CWD carriers. Wolves appear to target sick animals that, to the human eye, exhibit no overt symptoms of disease.

"There's a lot more going on than we can detect," Mech said. "They are killing animals that most people would say, 'That animal looks pretty healthy to me,' but in fact it isn't." Mech stays out of the political fray, though he says the value of predators is clear. "Based upon everything I've seen over the course of my career, I generally stand behind the assertion that wolves make prey populations healthier," he said. "The evidence to support it is overwhelming."

In Wolves on the Hunt: The Behavior of Wolves Hunting Wild Prey, Mech, Doug Smith and co-author/editor Daniel R. MacNulty undertook an exhaustive, unprecedented review of scientific studies and observations related to wolf behavior. They cite example after example of how wolves choose prey. They use intricately-detailed observations based on the work of park ecologist Rick McIntyre and colleagues who have tracked the wolves of Yellowstone's Lamar Valley for decades. They also point to hours upon hours of accumulated video footage amassed by award-winning wildlife cinematographer Robert Landis who has recorded numerous wolf predation incidents in Yellowstone.



"Suffice it to say here, in summer, that it is well documented...that wolves generally kill calves, fawns and older members of prey populations along with individuals that are diseased, disabled, or in poor conditions or that have various abnormalities," the authors noted. "These types of individuals are physically less able to withstand long and persistent attacks like more healthy animals can."

In 2003, then Denver Post reporter Theo Stein interviewed scientists about CWD spreading though deer and elk in Colorado. Dr. Valerius Geist, who briefly became a darling of anti-wolfers when he raised the issue of tapeworms, made this assertion about the significance of wolves in containing CWD spread via proteins called prions. "Wolves will certainly bring the disease to a halt," Geist said. "They will remove infected individuals and clean up carcasses that could transmit the disease."

The impacts of historic predator-killing campaigns have been documented.
Stein added that "Geist and Princeton University biologist Andrew Dobson theorize that killing off the wolf allowed CWD to take hold in the first place." Further, the Chronic Wasting Disease Alliance observed, "The spread of chronic wasting disease toward Yellowstone's famed game herds alarms wildlife lovers, but two top researchers think biologists will discover a powerful ally in an old frontier villain. The wolf."

Be it wolf, mountain lion, bear or coyote, each different predator species has different approaches to both taking prey and scavenging. Besides the significant body of evidence in the Mech-Smith MacNulty book, there is a lot of brainpower that has been applied to thinking how predators could help head off CWD.

Mountain lions are known for being ambush predators, lying in wait to target mule and white-tailed deer. Wolves and coyotes are "coursers" meaning they chase prey across open ground. Grizzlies and black bears take elk calves and deer fawns and, like the others, feast upon freshly killed carcasses, cleaning them down to the bone. Of note is that Mech and others have documented that wolves, for example, take down larger numbers of deer bucks, which, according to CWD researchers, also have a higher level of CWD prevalence in wild herds.
"In the main, the preponderance of scientific evidence supports the view that wolves generally kill the old, the young, the sick and the weak. Based upon everything I've seen over the course of my career, I generally stand behind the assertion that wolves make prey populations healthier. The evidence to support it is overwhelming." —Renowned American wolf biologist L. David Mech
In a 2010 peer-reviewed journal article, "Mountain lions
prey selectively on prion-infected mule deer," lead author Caroline E. Krumm with the Colorado

Division of Wildlife's scientific research center and four colleagues noted how cougars appeared to select for CWD-infected deer because they were easier to fell. Their research examined 108 kill sites where the big cats ambushed deer.

"From the observations gathered across several studies, we hypothesize that although much of the 'selection' we observed may be attributed to infected mule deer being less vigilant or fit and thus relatively vulnerable to 'attack' of one kind or another, mountain lions may also learn to recognize and more actively target diseased deer," they wrote.

Echoing Mech's observations, they pointed out "other studies indicate that coursing predators like wolves and coyotes select prey disproportionately if they appear impaired by malnutrition, age or disease."

Just as other scientists have warned that once CWD becomes firmly established in wildlife population and its effects over time can be dire, Krumm and co-authors suggested predators can help minimize prion contamination.

"Although theory suggests that removing infected animals could 'sanitize' and slow the rate of prion transmission, prevalence can be remarkably high in mule deer populations preyed upon by mountain lions. Prion transmission among deer can occur via several mechanisms, including indirect transmission from exposure to prions in the environment," they stated. "We observed that mountain lions typically consumed greater than 85 percent of a deer carcass, often including brain tissue, and this may be beneficial in decreasing prion contamination at kill sites. However, the extent to which selective predation by mountain lions alters the dynamics of prion disease epidemics in natural mule deer populations remains unclear."

That's why it's important to have the full predator-guild present, perpetually seeking out sick animals in different ways, in different parts of the landscape.

In 2006, researcher N. Thompson Hobbs wrote "A Model Analysis of Effects of Wolf Predation on the Prevalence of Chronic Wasting Disease in Elk Populations of Rocky Mountain National Park."

There, he created a simulation based upon meat consumption necessary to sustain a group of wolves and factoring the likelihood they would first target sick animals. Just as experts who deal with epizootic diseases warn that the Wyoming feedgrounds represent the worst possible conditions for CWD to take hold, likely to unnaturally accelerate an outbreak, wildlife predators can serve as a powerful counterbalance.

Hobbs lays out how it works. "Increased mortality rates [by predators] in diseased populations can retard disease transmission and reduce disease prevalence. Increasing mortality slows transmission via two mechanisms. First, it reduces the average lifetime of infected individuals. Reduced lifespan, in turn can compress the time interval when animals are infectious, thereby reducing the number of infections produced per infected individual," he writes. "The effect of reduced intervals of infectivity is amplified by reductions in population density that occur as mortality increases, reductions that cause declines in the number of contacts between infected and susceptible individuals. Both of these mechanisms retard the transmission of disease. If these mechanisms cause the number of new infections produced per infected individual to fall below one, then the disease will be eradicated from the population."

Granted, his analysis focused on Rocky Mountain National Park and Colorado where there is today a population-level outbreak of CWD under way and where there are no wolves. Rocky Mountain has densities of wapiti approaching 115 elk per square kilometer. The unnatural densities of elk on the Elk Refuge and Wyoming feedgrounds, Dorsey notes, are orders of

magnitude greater, literally thousands of elk per square kilometer. It means that should CWD take hold, predators would be even more important in aiding to stop a potentially virulent spread.

According to one study, CWD rates in Rocky Mountain were as low as one percent in the early 1990s. Since 2008, the proportion of female elk infected with CWD in the park has fluctuated between six and 13 percent. CWD is today the leading cause of death in adult female elk.

Despite claims that predators decimate big game herds, there is, in fact, little evidence to back up those assertions, broadly speaking. It's true that under certain circumstances the presence of predators can result in a significant population decline compared to numbers of ungulates present after species like wolves were eradicated. However, predator sinks are gross anomalies in the Rocky Mountain West; moreover, ecosystems are dynamic and populations of all species are always in some kind of flux.

Again, based upon surveys compiled by state wildlife agencies in Wyoming, Montana and Idaho, most elk hunting units—with wolves inside them—are at, close to, or above desired population goals for wapiti. Hunter success is high, especially for hunters willing to work at stalking their prey. Outfitters/guides throughout the tri-state region tout hunter success and boast of having happy customers.

What anti-predator voices never acknowledge is that the very prey species they covet—large, muscular bull elk and deer bucks—are products of thousands of years of evolution and pressure applied by predators, ecologists note. Pronghorn (antelope) on the prairies are fleet of foot because, as a result of survival of the fittest, they became biologically engineered to outrun North America's version of African cheetahs before those big cats went extinct.

McDonald of Montana Fish Wildlife and Parks has asserted that human hunters will be deployed to eliminate CWD. In Wisconsin, the state has spent millions of dollars depopulating areas of white-tail deer and enlisted hunters to remove animals in an effort to knock CWD back, all to no avail. CWD has spread from Wisconsin into both Minnesota and Michigan.

In 2011, Dr. Margaret Wild collaborated with Hobbs and two other authors on a paper, "The Role of Predation in Disease Control: A Comparison of Selective and Nonselective Removal on Prion Disease Dynamics in Deer." This study was based on a model that examined the likely effects of wolf predation on CWD-infected deer and holds possible implications for states in the Upper Midwest. The simulation noted that wolves could prevent CWD from emerging at the population level and proliferating. Crucial is allowing predators to perform their role in the early stages of the disease's arrival.

"Thus far, control strategies relying on hunting or culling by humans to lower deer numbers and subsequently CWD prevalence have not yielded demonstrable effects," they wrote, explaining that human hunters only remove sick deer randomly while predators actively seek out the infirmed.

"Doubling the vulnerability of infected animals to selective predation accelerated the rate of decline in prevalence," they noted, even encouraging the consideration of making sure predator populations were healthy in the forward zones of disease progression.

"We suggest that as CWD distribution and wolf range overlap in the future, wolf predation may suppress disease emergence or limit prevalence," they added.

The noted American-Canadian mammal biologist Dr. Paul Paquet has been monitoring the geographic expansion of CWD relative to the presense of long-established wolf populations since the disease was first confirmed in the wild decades ago.

"To date and in general, CWD has not thrived where wolf populations are active, although the disease has appeared on the margins of these populations. A simple mapping of the distribution of wolves and CWD is very instructive," Paquet told Mountain Journal. "I have not mapped the distribution of all large predators and CWD, but that would be an instructive exercise. In particular, a comparison of diverse multi-prey and multi-predator systems like Yellowstone with simpler systems like the Great Lakes would of interest, as well as comparing the mix and densities of predators with establishment of CWD."

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Why is confronting anti-wolf bias as important as the significant body of evidence pertaining to predators and CWD? Because the opinions that are informing policy don't align with reality.

Here, it is essential to provide some context of wolf presence in the West, more than two decades after Canis lupus was reintroduced to Yellowstone and the wilderness of central Idaho and since they have fanned out across a much wider area, reaching Oregon and Washington and possibly opening discussions of their return to Colorado.

In 2016, a record 243 livestock animals—154 cattle, 88 sheep, and a horse—were killed by wolves in Wyoming which a year ago had an estimated minimum wolf population of 377. Montana's wolf count is close to 500 and Idaho had 786 in 2015, according to the U.S. Fish and Wildlife Service.

The Fish and Wildlife Service no longer compiles a regional report for the northern Rockies/ Pacific Northwest since wolves were removed from federal protection and management handed over to the states.
Wolves account for about 1 percent of total livestock losses. Noteworthy is that only 62 of the 300-plus wolf packs in the western U.S. were involved in livestock depredation and the majority of those cases involved only a handful of livestock depredations at most. "What it means is that four of every five packs are existing without incident," former federal wolf biologist Michael Jimenez said.
Before he retired as the Fish and Wildlife Service's wolf field director, Michael Jimenez and I spoke annually about wolf losses—real and imagined—and this gets at McDonald's point about social tolerance and its connection to political rhetoric.

In April 2015, 36 Republican House members sent a letter to then Interior Secretary Sally Jewell and Fish and Wildlife Service Director Dan Ashe demanding wolves be delisted across all of the Lower 48. "Since wolves were first provided protections under the Endangered Species Act, uncontrolled and unmanaged growth of wolf populations has resulted in devastating impacts on hunting and ranching, as well as tragic losses to historically strong and healthy livestock and wildlife populations," those members of Congress wrote.

The phrase "devastating impacts on hunting and ranching, as well as tragic loses to historically strong and healthy livestock and wildlife populations" is, on the face of it, a fabrication. How?
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In one of the last reports Jimenez compiled, he noted that at the end of 2014 there were an estimated 1,800 wolves comprising roughly 313 packs. Across Wyoming, Idaho, Montana, Oregon and Washington, all those wolves in that year were confirmed to have killed a total of 140 cattle, 172 sheep, four dogs, one horse and one donkey. In a vast region where there are

millions of cattle, sheep, dogs, horses and donkeys — and thousands of ranchers and farmers — is this what members of Congress mean by "devastating" and "tragic"?

Across the West, thousands upon thousands of domestic cows and sheep perish each year from disease, weather, accidents, eating poisonous plants, lightning strikes and predation of all kinds, including killing by feral dogs. Wolves account for about 1 percent of total livestock losses. Noteworthy is that only 62 of the 300-plus wolf packs in the western U.S. were involved in livestock depredation and the majority of those cases involved only a handful of livestock depredations at most. "What it means is that four of every five packs are existing without incident," Jimenez said.

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Those who possess a disdain for wolves have, for years, thrown up a series of theories, all either discredited or unsubstantiated. The first was that wolves would decimate big game herds. Fact: it hasn't happened and most big game populations in wolf country are at or above population objectives. Click here to get the 2017 elk outlooks for Montana, Wyoming, and Idaho. Recently, an analysis conducted by the Washington Department of Fish and Wildlife showed that wolves in the eastern part of that state were not harming populations of deer, elk, moose and bighorn sheep.

Those who possess a disdain for wolves have, for years, thrown up a series of theories, all either discredited or unsubstantiated. The first was that wolves would decimate big game herds. Fact: it hasn't happened and most big game populations in wolf country are at or above population objectives.

Another claim is the lobos reintroduced from Canada were the "wrong subspecies" and substantially different from wolves that existed in Greater Yellowstone and central Idaho prior to their extermination. Fact: also not true. Click on video here that addresses that contention.

More recently, as those notions have been dismissed as absurd, two new contentions have been advanced. There's one claim that wolves represent an imminent danger to humans, pets and wildlife health because they carry Echinococcus granulosus, a tapeworm linked to hydatid disease. Not only is this dismissed as untrue and fear-mongering, but the tapeworm is found widely in elk, deer and moose. Hunters are advised to take precautions such as wearing gloves in field dressing animals.

The latest unproved charge, raised again at the Montana wildlife commission meeting, is that wolves may themselves be vectors for spreading CWD because they eat disease-infected elk and deer and might therefore disperse prions via their scat. Opinion is divided on whether prions, being hardy agents, can survive passage through a wolf, or bear, coyote, or mountain lion's digestive track. It's possible.

Nonetheless, ecologists say that the role of predators in removing CWD-infected animals and "cleaning-up" carcasses by scavenging them would more than likely offset any negative potential they have for dispersing CWD more widely via scat. Migratory deer and elk already are already moving hundreds of miles seasonally across and between vast expanses of land, shedding CWD prions into the environment along the way via urine, feces, saliva and decomposing tissue when they die.

Critics say the denial coming from western states about the beneficial role predators can play in slowing the advance of CWD is driven by a backward cultural mindset—reinforced by politicians who perpetuate it to get elected—that has little or no scientific basis. In the case of CWD, states that continue to adhere to anti-predator policies may, in fact, be making disease impacts worse.

Adds Dorsey, "At this urgent moment, when everyone is scrambling to do what's sensible, now is not the time to be killing off the very biological tools we need."

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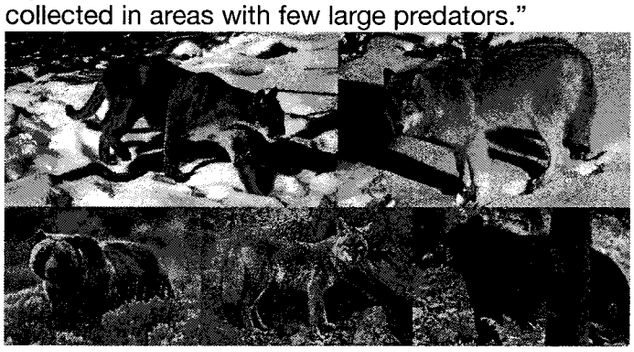
CWD is literally at the gate of Yellowstone and its arrival has park officials worried.

A decade ago, P. J. White and Troy Davis provided an overview of CWD for an article that appeared in the journal Yellowstone Science. Referencing the study by Wild and Miller, and noting that wolves could have "potent effects" in tamping down CWD prevalence, they wrote, "Wolves [in Yellowstone] are highly selective for elk throughout the year and bears are highly selective of neonatal elk during summer. If predators can detect CWD-infected animals, then selective predation and quick removal of carcasses by scavengers could reduce CWD transmission rates and, in turn, the prevalence and spread of the disease. Wolves could also reduce the risk of transmission by dispersing deer and elk."

With predators on the landscape, again based on simulations run at Rocky Mountain National Park, "compensatory and density-related effects could result in less net mortality than rates of infection and death from CWD would suggest. Thus, the net effect of CWD on the abundance, reproduction, and survival of deer and elk could be less than predicted based on data collected in areas with few large predators."



Many scientists say that Greater Yellowstone's full predator guild represents a formidable gauntlet to CWD.

In March 2016, Yellowstone assembled its "Chronic Wasting Disease Surveillance Plan". Looming large in the document is this acknowledgment by the three authors Chris Geremia, John Treanor, and P. J. White: "If epidemics lead to widespread population reductions in Yellowstone, CWD could indirectly alter the structure and function of this ecosystem during future decades; adversely affect species of predators and scavengers; and have serious economic effects on the recreation-based economies of the area."

The authors note that Yellowstone, by law, is mandated to confront diseases that threaten its mission to promote the persistence of native species, but CWD represents a conundrum. "A primary purpose of Yellowstone National Park is to preserve abundant and diverse wildlife in one of the largest remaining intact ecosystems on earth. Disease management actions such as depopulation or substantial population reductions by random culling may be inappropriate for the park because they would remove many more healthy animals than infected animals, substantially reduce the prey base for predators and scavengers, and result in fewer benefits (e.g., scientific knowledge) and reduced visitor enjoyment (e.g., recreational viewing)."

No strategy has been effective at eradicating CWD from areas where the disease is present. Disease management objectives will focus on early detection and monitoring," park officials say. Yellowstone in summer is a mixing bowl where as many as 20,000 deer and elk from multiple herds converge, including animals from the Jackson Elk Herd that winters on the

National Elk Refuge and state feedgrounds. Those animals, in turn, mix with tens of thousands more.

Yellowstone, along with officials in Montana, Idaho, the Elk Refuge and Wyoming state feedgrounds are on the lookout for sick-looking animals, testing carcasses of dead animals and even removing asymptomatic elk. Wolves, lions, and coyotes are always on the lookout, prowling.

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Gary Wolfe is hardly the only one who questioned McDonald's claims about wolves and predators not being impactful. I asked McDonald if he really believed what he said. "I don't think predators are going to hurt our efforts in addressing CWD but I don't think they are going to make a significant difference in stopping the spread of it. You'd have to have a pretty significant population of predators to have a significant reduction on populations of deer carrying CWD."

McDonald has said that hunters are a better tool for trying to control CWD but it's clear most hunters cannot discern an asymptomatic CWD-infected deer or elk from a healthy one.

Some 15 years ago and just months before he died tragically in an auto wreck, Tom Thorne, who had served as Wyoming chief wildlife veterinarian, acknowledged to Theo Stein of The Denver Post that cultural hatred of wolves trumped science. "Emotions against wolves are so strong that I'm not sure this potential benefit, which I agree might be there, would sway the opinions of many folks," he said. "I think it would be a long, long time before people are used to wolves enough to admit they might be doing a bit of good."

Is the civic dialogue and the public conversation about predators in Montana any more evolved? Bill Geer, president of the Montana Wildlife Federation, praised state wildlife managers for their bolstered surveillance and putting in motion an attempt to stop CWD before its foothold deepens. But he too encouraged McDonald and colleagues to reconsider their attitude toward predators.

"The outbreak [of CWD]...speaks to the benefit of having apex predators like wolves and mountain lions on the landscape. Wolves and mountain lions often preferentially kill compromised animals, and once a CWD infected animal starts to show signs of the disease, it will be easier to kill for wolves," Geer wrote on Nov. 28, 2017. "That's the way every effective predator hunts. That does not imply that CWD infected animals are not shedding the prions that spread the disease before they start to show symptoms. It does mean that predators could be a factor to help remove infected animals from the population. It's important that these predators play their role in a functioning ecosystem."

Few former civil servants in the world are more conversant on the topic of rural hostility toward predators than Norman Bishop. He spent 36 years with the National Park Service and played a vital role in Yellowstone's drafting of an environmental impact statement on wolf reintroduction. The document drew upon the best available wolf science going back half a century, including studies of how the animals stalk prey.

Prior to wolves being brought back to Yellowstone, and afterward, Bishop gave more than 200 public presentations on the ecological role. He received many different forms of personal threats from people who refused to hear what he had to say and politicians even sought to have him fired for calling them out when they claimed wolves represented a pervasive threat to human safety.

In November, Bishop, who today is retired, attended the public meeting on CWD where McDonald asserted there is no evidence substantiating the value of predators. He is incredulous that McDonald made the claim. "Wolves are out there sweeping the landscape 365 days a year, rooting out sick animals. Why would you want to remove the best weapons you have? It makes no sense," he told me. "What do the states have to lose by bringing predators into this fight which basically means just leaving them alone to do their jobs?"

One of the state officials who attended the recent Montana Fish and Wildlife Commission meeting told me, "Wolf advocates have been trying to get the commission to recognize the positive role of predators and make it an official part of the CWD strategy but there are folks pushing back who say they can't handle anything that even remotely casts wolves in a positive light. People are reluctant to do it because they believe there would be a political downside."

A political downside even worse than having Montana's elk and mule herds decimated by CWD? I asked.

"What we are witnessing with wolves is a battle of modern scientific data against entrenched Old West dogma and we are in a time in which data doesn't appear to matter to those who cling to dogma," Bishop said. "It is disheartening to realize how the states have abandoned good sense."
"What we are witnessing with wolves is a battle of modern scientific data against entrenched Old West dogma and we are in a time in which data doesn't appear to matter to those who cling to dogma. It is disheartening to realize how the states have abandoned good sense." —
Conservationist Norm Bishop
At a public event in Bozeman recently, before a crowded room, Bishop served up one of pioneering ecologist Aldo Leopold's most famous quotes, lifted from Leopold's book, A Sand County Alamanac. "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

In their tome, Wolves on the Hunt, Mech, Smith and MacNulty note in field observation after field observation how difficult it is to be a predator like a wolf making a living with its mouth. The vast majority of predator attempts to take down large game animals are unsuccessful—by some estimates more than eight of every ten tries fail—and each one comes replete with the very real possibility that the wolf could get killed or maimed.

Survival of the fittest has a huge upside for those who care about elk and deer. "And so it goes, day after day, as wolves continue their rounds, ever searching for more vulnerable prey animals, chasing, missing, trying again and again, and eventually connecting," the authors wrote. "The net result of all this sifting and selecting of prey over eons is that the prey gradually get faster, smarter, and more alert."

Sadly, conservationists say, the U.S. Fish and Wildlife Service—the agency that is supposed to be a global leader in professional wildlife management—has been an accomplice in the CWD controversy. The agency continues to unnaturally feed thousands of wapiti at the National Elk Refuge under its command and yet the agency willfully is breaking its own mandates pertaining to wildlife health as noted by a panel of U.S. Circuit Court judges.

Second, Dorsey and Bishop note, it was the Fish and Wildlife Service which, in removing wolves from federal protection, handed over their management to Wyoming, knowing the very essence of recovering a species.

Never before in the history of the Endangered Species Act was an animal brought back only to, under state management, be immediately subjected to antiquated policies of re-eradication. If there were compelling reasons for artificially feeding wildlife, which is making the herds of

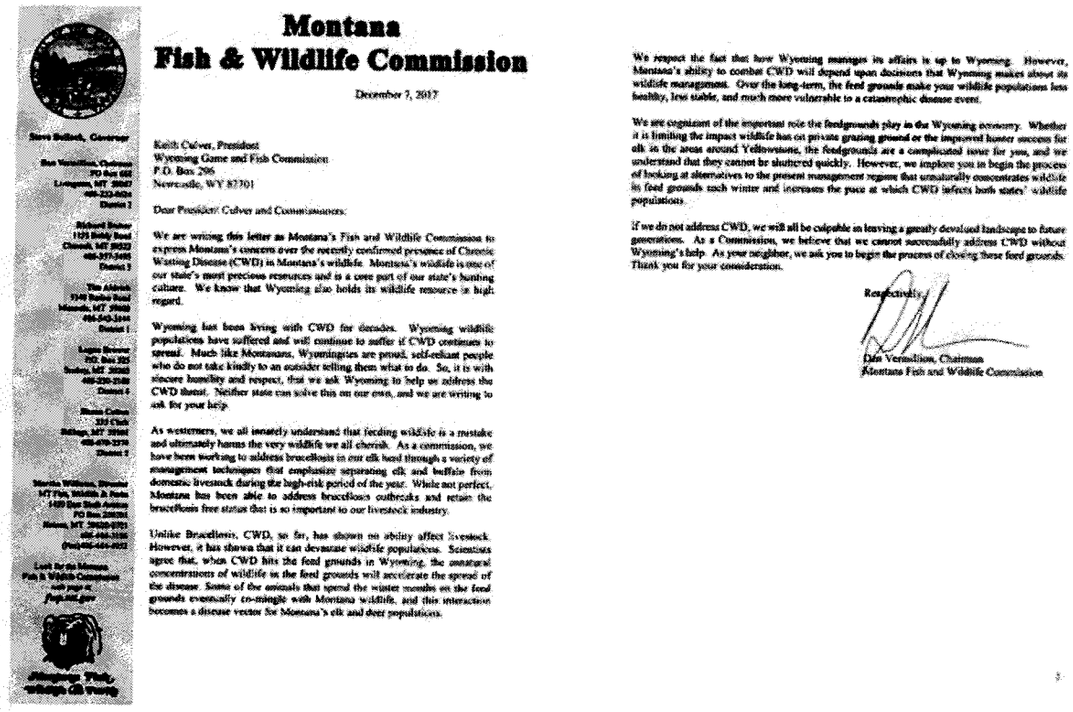
Greater Yellowstone sicker, and for the gratuitous killing wolves, some of it might make sense. But none of it does, they note.

Today, akin to many fronts of U.S. environmental policy, discussions about the ecological niche of predators appears to be yet another example in which science and natural history are warped or ignored in favor of carrying out political agendas. In the case of wolves, are politicians refusing to accept reality because it cuts against the grain of myths they have helped to perpetuate and they are concerned they might lose votes from ecologically unenlightened constituents? If yes, what kind of wildlife management is it producing?

In the second part of this series, Tim Preso, a senior attorney with the environmental legal firm EarthJustice, noted that these are government agencies legitimizing their own known violations of laws, tenets and scientific truths in natural history that protect wildlife health. Instead, both federal and state agencies are violating the public trust doctrine they claim to uphold and spelled out in the North American Model of Wildlife Management.

"I don't know that anything else exists with management policy in the Greater Yellowstone Ecosystem so blatantly contrary to the science, the law and common sense and involves a state that is so resistant to change," he noted. Does that summation apply as equally to Montana and Idaho as to Wyoming? Preso doesn't yet have an answer.

EDITOR'S NOTE: Below is a copy of the letter that the Montana Fish and Wildlife Commission sent to the Wyoming Game and Fish Commission on Dec. 7, 2017 regarding feedgrounds:



Montana
Fish & Wildlife Commission

December 7, 2017

Keith Culver, President
Wyoming Game and Fish Commission
P.O. Box 296
Newcastle, WY 82701

Dear President Culver and Commissioners:

We are writing this letter as Montana's Fish and Wildlife Commission to express Montana's concern over the recently confirmed presence of Chronic Wasting Disease (CWD) in Montana's wildlife. Montana's wildlife is one of our state's most precious resources and is a core part of our state's hunting culture. We know that Wyoming also holds its wildlife resource in high regard.

Wyoming has been living with CWD for decades. Wyoming wildlife populations have suffered and will continue to suffer if CWD continues to spread. Much like Montanans, Wyomingites are proud, self-reliant people who do not take kindly to an outsider telling them what to do. So, it is with sincere humility and respect, that we ask Wyoming to help us address the CWD threat. Neither state can solve this on our own, and we are writing to ask for your help.

As westerners, we all innately understand that feeding wildlife is a mistake and ultimately harms the very wildlife we all cherish. As a commission, we have been working to address brucellosis in our elk herd through a variety of management techniques that emphasize separating elk and buffalo from domestic livestock during the high-risk period of the year. While not perfect, Montana has been able to address brucellosis outbreaks and retain the brucellosis free status that is so important to our livestock industry.

Unlike Brucellosis, CWD, so far, has shown no ability affect livestock. However, it has shown that it can devastate wildlife populations. Scientists agree that, when CWD hits the feed grounds in Wyoming, the unnatural concentrations of wildlife in the feed grounds will accelerate the spread of the disease. Some of the animals that spend the winter months on the feed grounds eventually co-mingle with Montana wildlife, and this interaction becomes a disease vector for Montana's elk and deer populations.

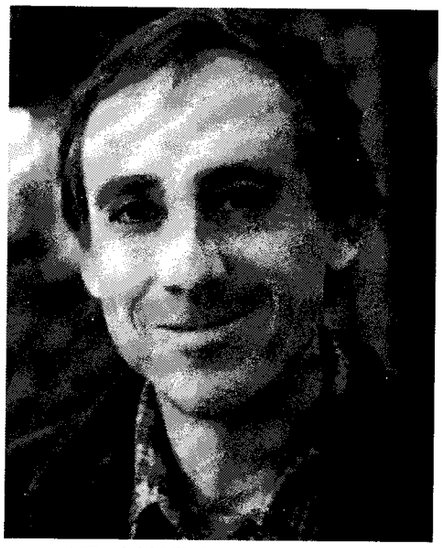
We respect the fact that how Wyoming manages its affairs is up to Wyoming. However, Montana's ability to combat CWD will depend upon decisions that Wyoming makes about its wildlife management. Over the long-term, the feed grounds make your wildlife populations less healthy, less stable, and much more vulnerable to a catastrophic disease event.

We are cognizant of the important role the feedgrounds play in the Wyoming economy. Whether it is limiting the impact wildlife has on private grazing ground or the improved hunter success for elk in the areas around Yellowstone, the feedgrounds are a complicated issue for you, and we understand that they cannot be shuttered quickly. However, we implore you to begin the process of looking at alternatives to the present management regime that unnaturally concentrates wildlife in feed grounds each winter and increases the pace at which CWD infects both states' wildlife populations.

If we do not address CWD, we will all be culpable in leaving a greatly devalued landscape to future generations. As a Commission, we believe that we cannot successfully address CWD without Wyoming's help. As your neighbor, we ask you to begin the process of closing these feed grounds. Thank you for your consideration.

Respectively,

Dan Vermillion, Chairman
Montana Fish and Wildlife Commission



About Todd Wilkinson

Todd Wilkinson is an American author and journalist proudly trained in the old school tradition. For more on his career, click below.

Submitted to Montana Environmental Quality Council 17 January 2018 by

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